VOL. XLVI. No. 8 AUGUST 1961

MECCANO MAGAZINE

1/3

OLD-TIME WHALER

HORNBY SPEED BOATS



The boats with the longest run

Fast, tough, realistic! Hornby Speed Boats beat all other clockwork Speed Boats in their class; they can travel *over 120 feet in one winding!* At the seaside, on the boating pool, lake or pond, these are the smartest craft. There are three magnificent Speed Boats to choose from: the R.A.F. Launch, the River Launch and the Fast Patrol Launch. All are made of strong plastic with rustproofed clockwork motors and rudders, and are finished with characteristic Hornby accuracy of detail.

MADE BY MECCANO LTD.

FAMED FOR RELIABILITY AND REALISM

Model No. 5
R.A.F. Range Safety Launch

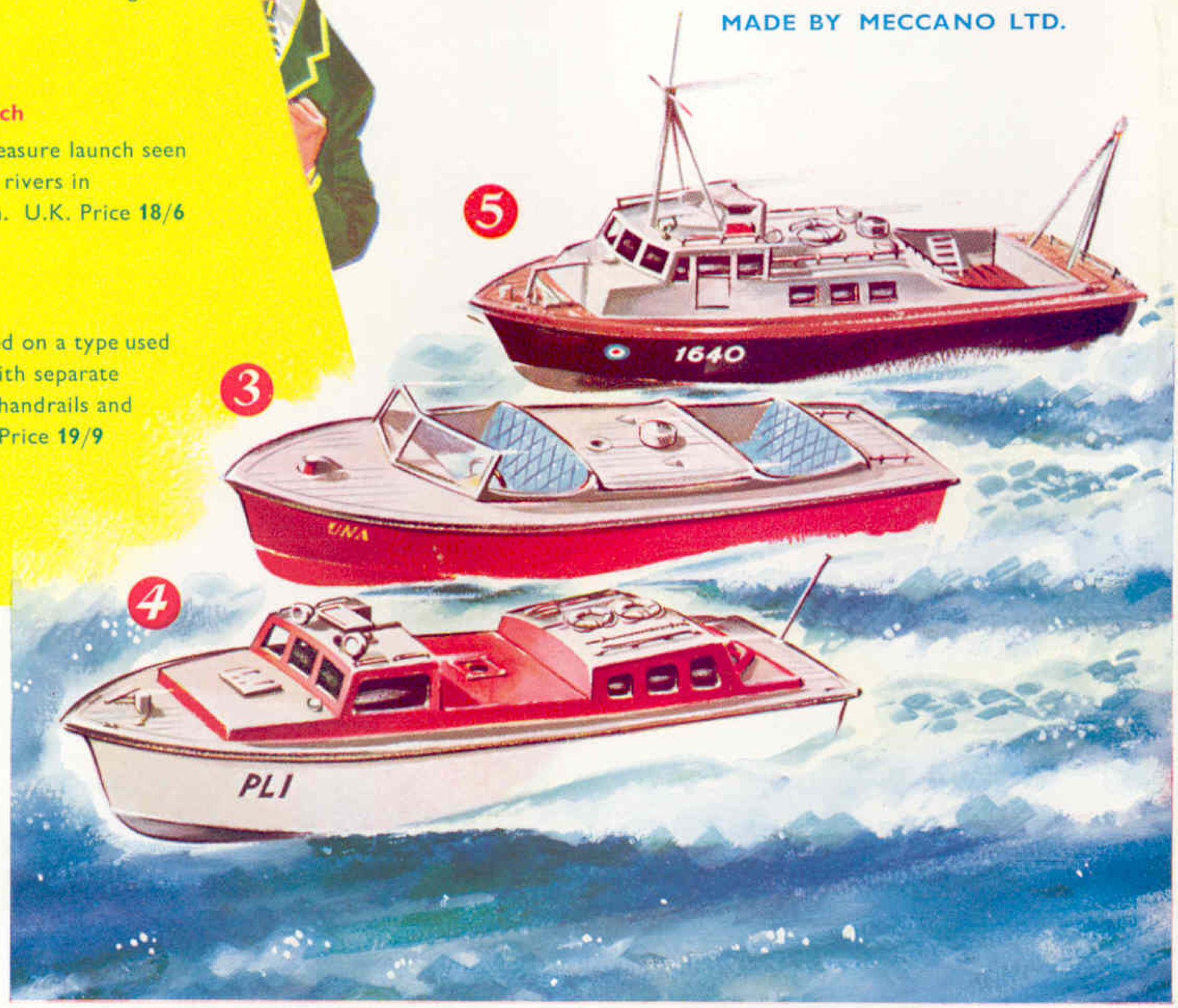
With separate fittings which include mast, handrails and searchlight. The prototype is used on R.A.F. bombing ranges to keep stray vessels away from the danger zone. Length 10 in. U.K. Price **19/9**

Model No. 3
Twin Cockpit River Launch

Fashioned on the type of pleasure launch seen in large numbers on British rivers in summertime. Length 10¾ in. U.K. Price **18/6**

Model No. 4
Fast Patrol Launch

A distinctive vessel modelled on a type used by river police. Supplied with separate moulded fittings—lifebelts, handrails and mast. Length 10½ in. U.K. Price **19/9**

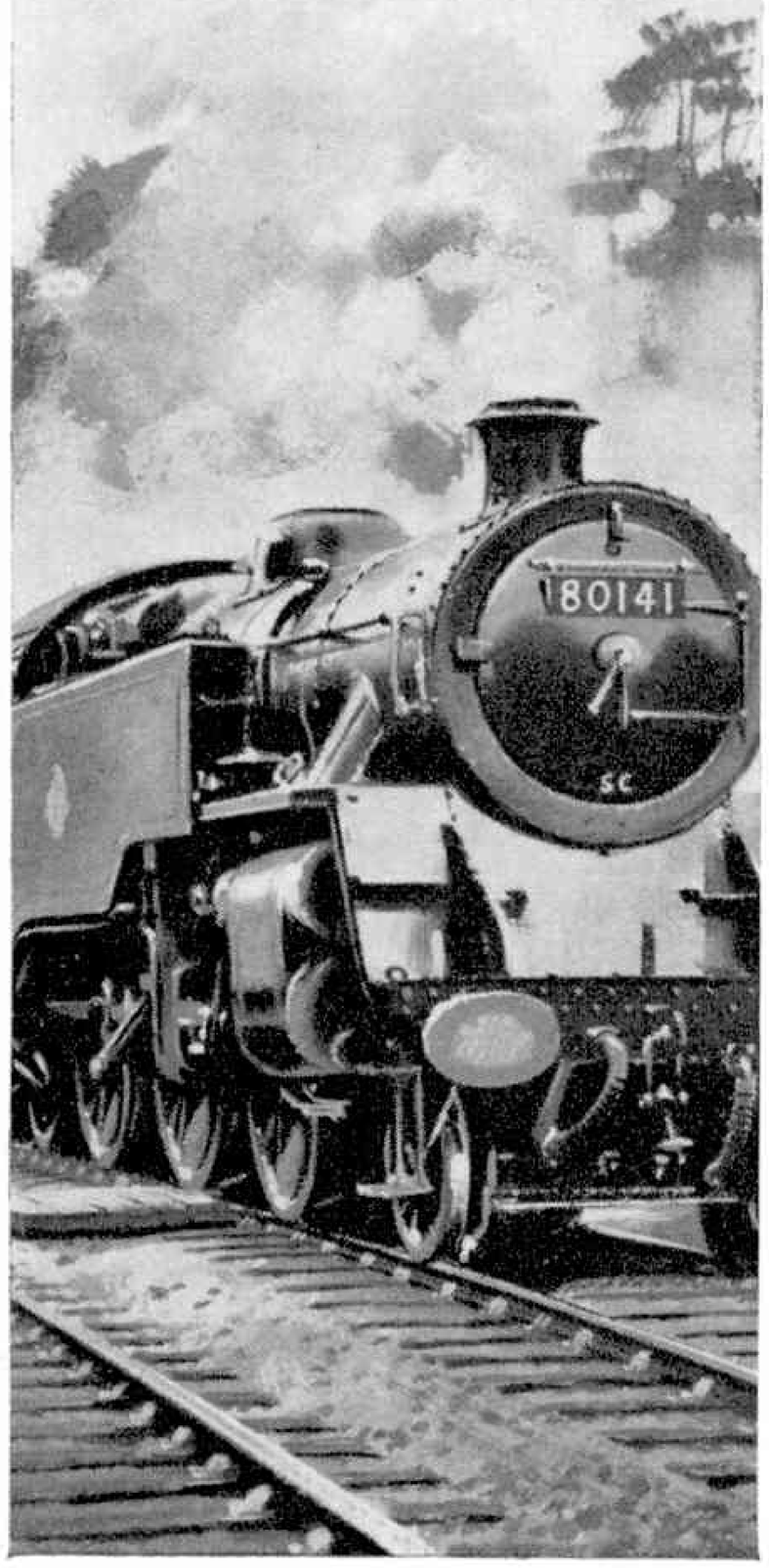


KEY BUOY WITH KEY



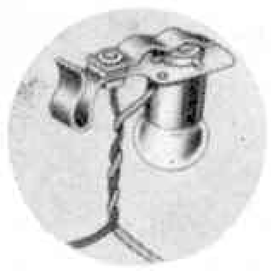
Reliable, realistic and it is almost impossible to lose the key because now you can buy a plastic unsinkable buoy complete with Key. U.K. Price **1/–**

HORNBY
DUBLO
ELECTRIC TRAINS



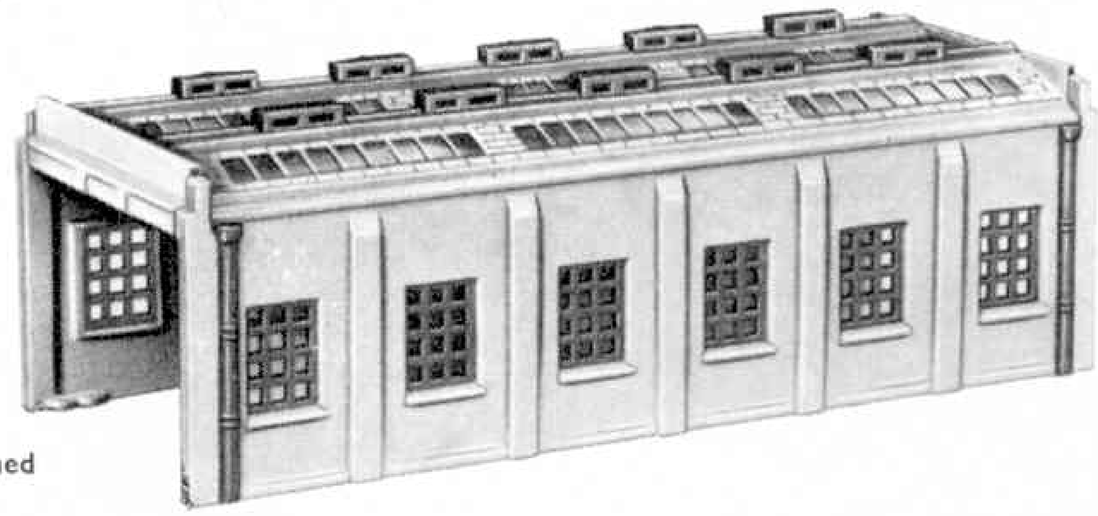
ACCESSORY KITS

for your '00' gauge railway



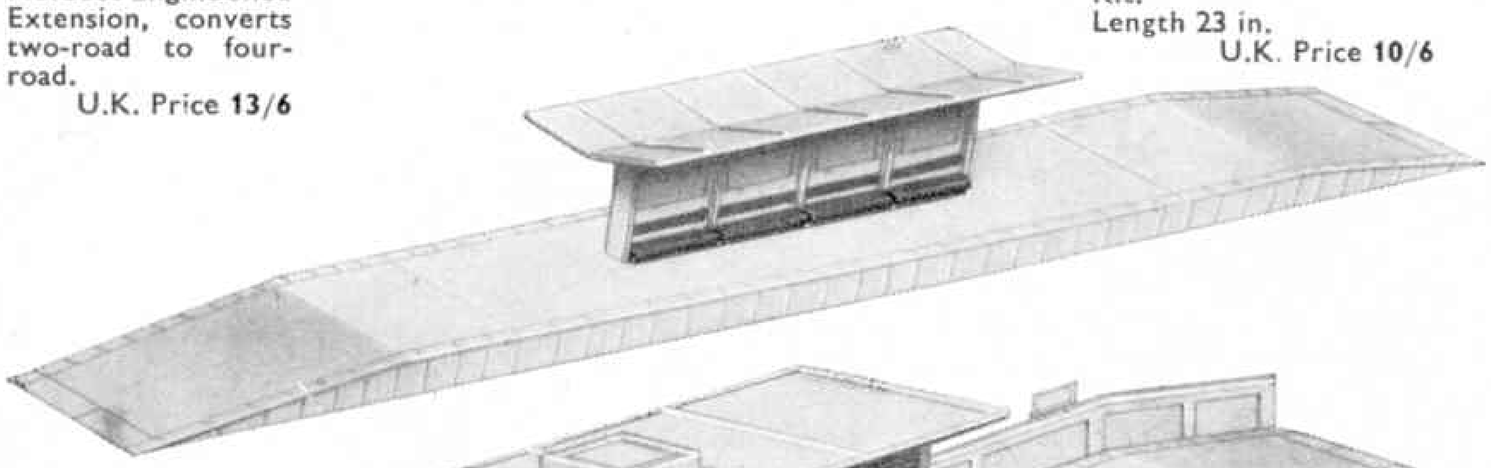
No. 1575 Lighting Kit for buildings, e.g. Station, Engine Shed, Goods Depot. U.K. Price **3/3**

No. 1576 Terminal Panel for use with Lighting Kit. U.K. Price **2/–**

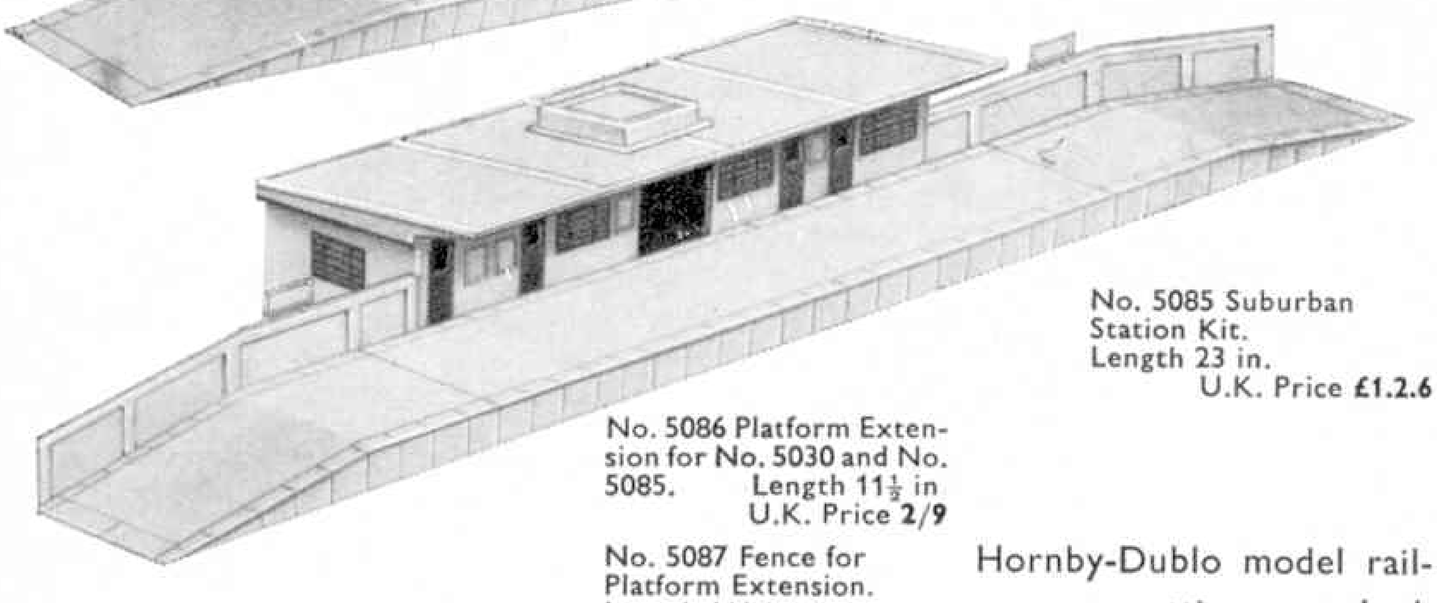


No. 5005 Engine Shed Kit—two-road. Length 12¾ in. U.K. Price **18/6**

No. 5006 Engine Shed Extension, converts two-road to four-road. U.K. Price **13/6**



No. 5030 Island Platform Kit. Length 23 in. U.K. Price **10/6**

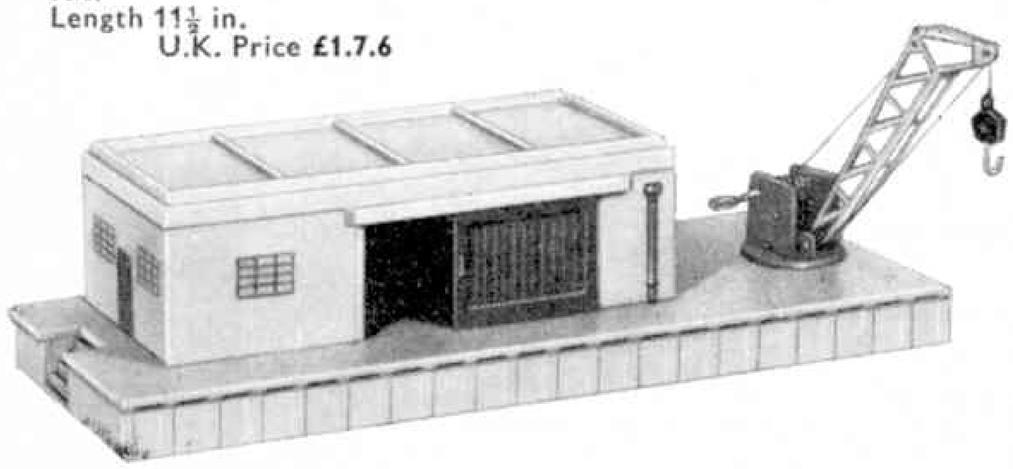


No. 5085 Suburban Station Kit. Length 23 in. U.K. Price **£1.2.6**

No. 5086 Platform Extension for No. 5030 and No. 5085. Length 11½ in U.K. Price **2/9**

No. 5087 Fence for Platform Extension. Length 11½ in. U.K. Price **1/6**

No. 5020 Goods Depot Kit. Length 11½ in. U.K. Price **£1.7.6**

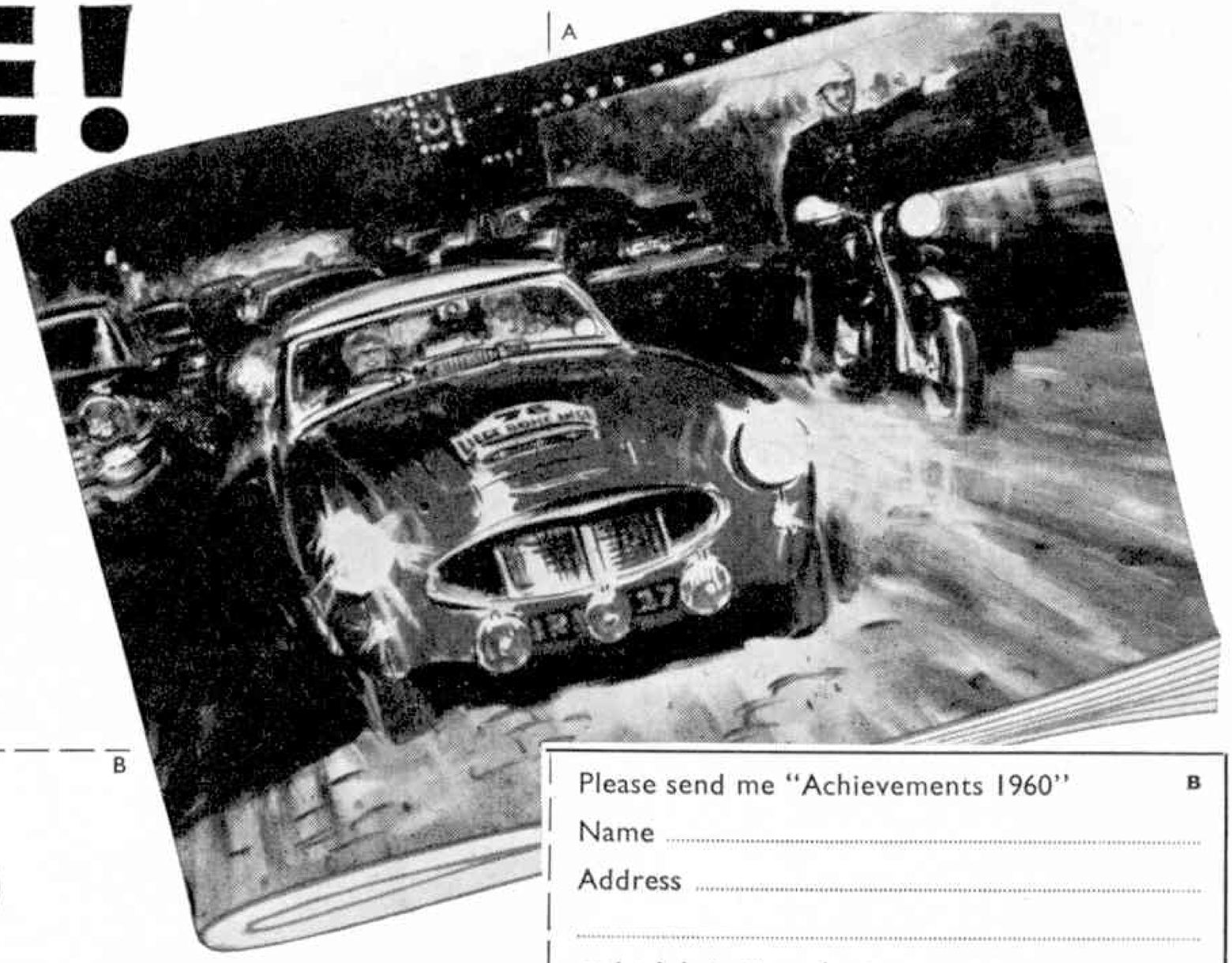


Hornby-Dublo model railways are getting a new look with these build-it-yourself kits of moulded polystyrene parts. They can be assembled in a few minutes, and dismantled even more speedily. The Engine Shed, and the platforms of the passenger Stations, can be extended by the addition of separate sections.

MADE BY MECCANO LIMITED

FREE!

The Motoring Book of the Year!



A

B FOLD HERE B

1960 CASTROL ACHIEVEMENTS BOOK

Sport on wheels! Many of the most spectacular successes of 1960 in motor and motorcycle racing, rallying, hill climbs and record breaking in breath-taking photographs you'll be thrilled to see! FREE LUBRICATION CHARTS AS WELL. Get your Dad a free Lubrication Chart ★for the car, motor cycle, or scooter—and one for three of your friends' Dads, too! Don't forget to fill in the details, and fold up this page as shown below.

★*Lubrication charts are available for most motor cars. Motor cycle and scooter charts are available for the following makes only:*

Ariel, A.J.S., B.S.A., Matchless, Norton, Triumph, Lambretta, N.S.U., Vespa, Zundapp

C FOLD HERE C

FOLD HERE

Please send me "Achievements 1960" B

Name .....

Address .....

.....

and a lubrication chart:—

Make..... Model..... Year.....

And one to each of my friends:—

Name .....

Address .....

.....

and a lubrication chart:—

Make..... Model..... Year.....

Name .....

Address .....

.....

and a lubrication chart:—

Make..... Model..... Year.....

Name .....

Address .....

.....

and a lubrication chart:— M.M.

Make..... Model..... Year.....

Postage will be paid by Castrol Limited.

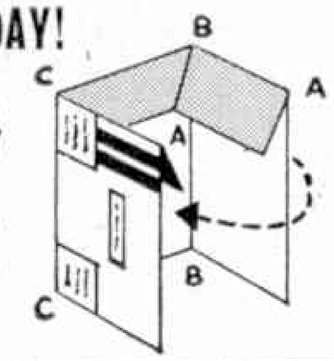
No postage stamp necessary if posted in Great Britain or Northern Ireland.

BUSINESS REPLY SERVICE
LICENCE NO. W.D. 74

CASTROL LIMITED,
CASTROL HOUSE,
MARYLEBONE ROAD,
LONDON, N.W.1

POST THIS COUPON TODAY!

Fill in the coupons completely, tear out the whole page and fold along A, B and C as shown. Then tuck in the flap as in the diagram, and post it. NO STAMP NEEDED.



A



AN ARMY APPRENTICE TESTING MOBILE RADAR EQUIPMENT

16- AND THE SKY'S THE LIMIT

If you're aiming high when you think of your career, think of electronics–the keyword to success in the space age. The Army trains boys in electronics, as well as many other trades. But, of course, you'll want excitement, adventure and fun as well–the Modern Army offers all this with lots of travel and really good pay.

THINK ABOUT IT EARLY – WHEN YOU'RE BETWEEN 14½ & 16½

An Army Apprentices school can start you on a top-line career. There's first-class training in any one of 40 trades and you're paid as you learn. Board, lodging and uniforms are free – with two months' paid holiday a year. After your training you can earn up to £20 a week...or more if you become an officer. **FIND OUT ABOUT IT.** Post this coupon today. (Applications for the next entry in September must be sent in as early as possible.)

TO THE WAR OFFICE (MP6)
LONDON, S.W.1.

Please send me full details of Army Apprentices —without obligation

NAME..... AGE.....

ADDRESS.....

.....

AA11/QP

LOOK!



PLAY RISK — IT'S SMASHING! This exciting new game has already swept America and the Continent. You'll *love* RISK, especially if you've ever played Monopoly . . . be first in the field to learn this exciting game. Engage in fascinating inter-Continental manoeuvres, match your skill against your pals and test your knowledge of strategy with new w-o-n-d-e-r-f-u-l RISK!

27/6

RISK!

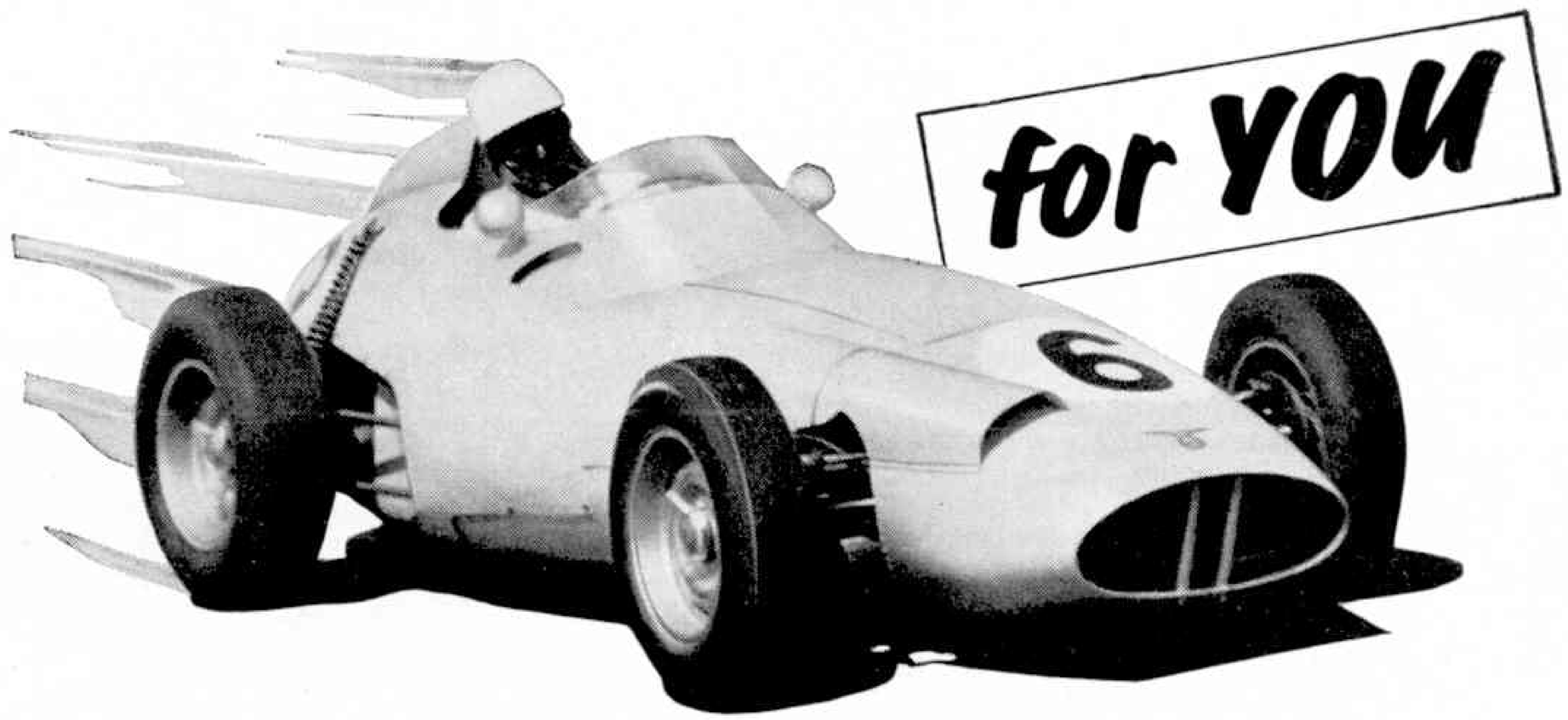
A NEW GAME OF STRATEGY

BY **WADDINGTONS** MAKERS OF THE FAMOUS **'MONOPOLY'**



a free trip by air

to the Italian Grand Prix



The DUNLOP racing contest by Revell

Win a FREE trip to the Italian Grand Prix in sunny Monza on September 10th. Fly with your father . . . stay at a luxury hotel . . . watch your favourite driver in action and meet the winner in the famous Dunlop pits!
Go to your Hobby, Toy, Model or Cycle Shop now for your entry form and rules of the exciting Dunlop racing contest by Revell! but hurry, *the closing date is August 21st, 1961!*

Open to all boys under sixteen.

Revell Authentic Kits

MANUFACTURED IN GREAT BRITAIN

REVELL CADETS—*ONLY* 2/11d!

Revell (Great Britain) Ltd., Maidstone House, 25/27 Berners Street, London W1

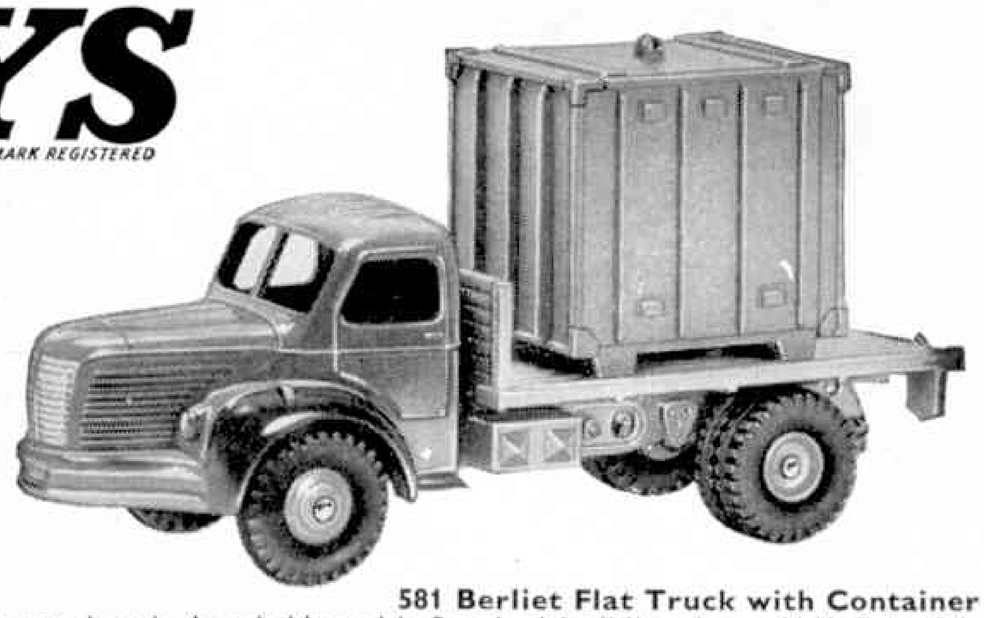
DINKY TOYS

TRADE MARK REGISTERED

from PARIS

A separate range of Dinky Toys is made by Meccano (France) in Paris. Several of these French models have been imported into the U.K., and they are illustrated here. Ask your Dinky Toys dealer to show them to you.

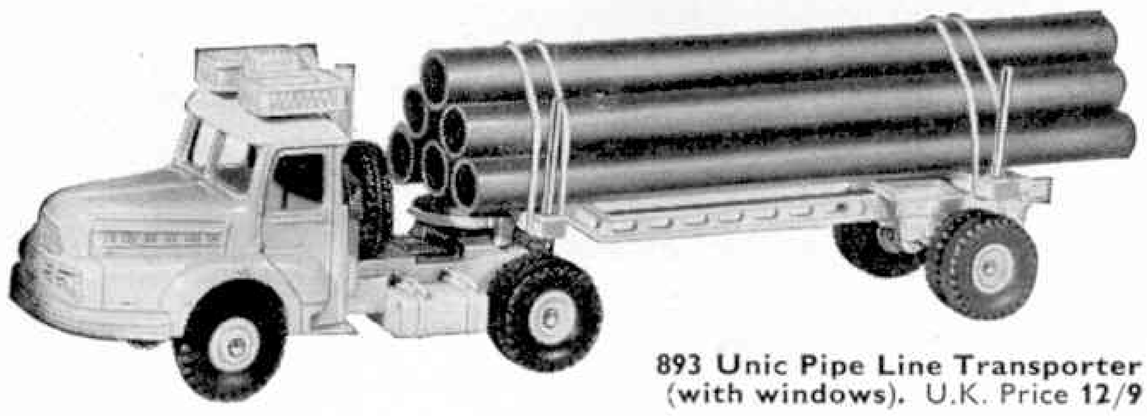
★ ★ ★



581 Berliet Flat Truck with Container
The container is detachable and is fitted with sliding door. U.K. Price **9/–**



579 Simca Glaziers Lorry
U.K. Price **8/6**



893 Unic Pipe Line Transporter (with windows). U.K. Price **12/9**

LOADS FOR YOUR LORRIES

Here are some fascinating accessories from our Works in France. They may be used most realistically with Dinky Toys lorries and wagons, and with Hornby-Dublo electric trains. They are made in plastic, and the cases are splendid imitations of wooden packing cases, one side of which is removable. The barrels consist of two halves which can be fastened together and opened by pressing a small "bung" in the centre, and the bottles may be removed from the containers in which they are placed.



846



847



849



850

846 Oil Drums (pack of six) U.K. Price **1/3**

847 Barrels (pack of six) U.K. Price **1/3**

849 Packing cases (pack of six) U.K. Price **1/3**

850 Crates of bottles (pack of six) U.K. Price **1/3**

851 Set of 2 each Nos. 846, 847, 849 & 850 (pack of eight) U.K. Price **1/9**

502 Garage
The door opens when you press the chimney and the car enters and leaves the garage automatically. U.K. Price **8/6**

MADE BY MECCANO (FRANCE) LIMITED

KEILKRAFT HANDBOOK

A "must" for all Modellers!

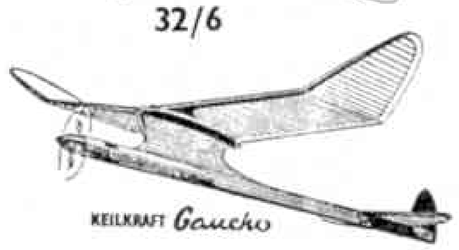




KEILKRAFT *Caprice* 15/9



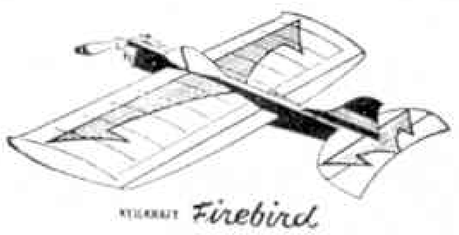
KEILKRAFT *Marquis* 32/6



KEILKRAFT *Gaucho*



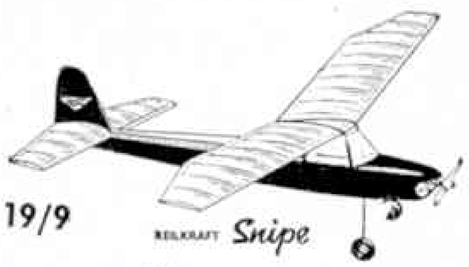
KEILKRAFT AJAX 8/-



KEILKRAFT *Firebird* 24/6



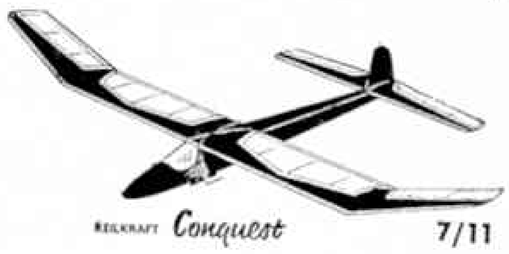
KEILKRAFT HALO 19/9



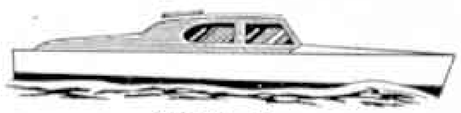
19/9 KEILKRAFT *Snipe*



KEILKRAFT *Phantom Mite* 14/6



KEILKRAFT *Conquest* 7/11



KK *Neptune* 12/-



KEILKRAFT *Otter* 7/6



KEILKRAFT *Terrier* 7/6

Packed with interesting features and information, and illustrated catalogue of all Keilkraft kits and accessories. ALSO FREE FULL SIZE PLAN OF THE "CYCLONE" CONTROL LINE MODEL!

POST THIS COUPON TODAY to E. KEIL & CO. LTD., Wickford, Essex

Please send me a copy of Keilkraft Handbook. I enclose Postal Order for 2/6.

NAME.....

ADDRESS.....

(Please print clearly) .....

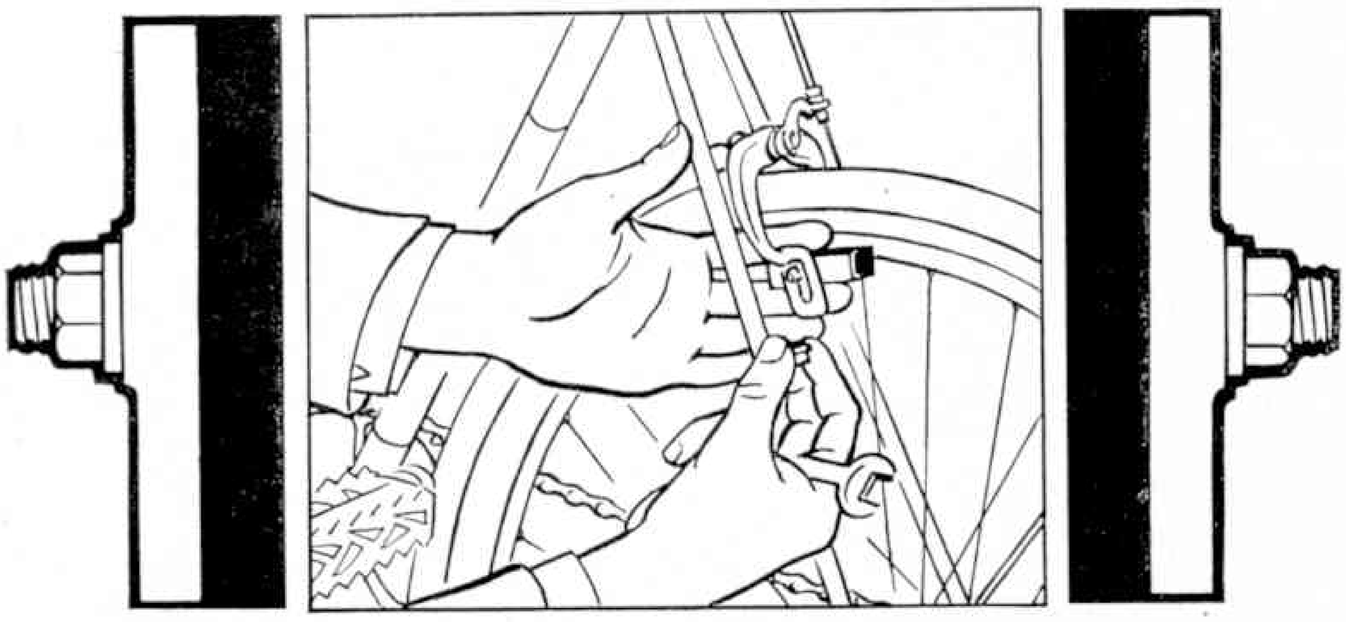
MM

STIRLING MOSS says

"brake linings for my cars or brake blocks for your bike... It's FERODO for FAST stopping!"



New Ferodo blocks with AQUON give racing performance under all weather and road conditions



In dry weather, new Ferodo Brake Blocks with special ingredient AQUON give *extra* control. Under wet conditions, braking performance is THREE times better than ordinary blocks can give.

FIT **FERODO**

NEW HIGH-PERFORMANCE BRAKE BLOCKS FOR SAFETY AT SPEED!

At your cycle shop now—
unmounted blocks or
blocks mounted in shoes.



10/30

FERODO LIMITED CHAPEL-EN-LE-FRITH *A Member of the Turner & Newall Organisation.*

for every holiday handyman it must be

SECCOTINE

REGD



There's nothing like real SECCOTINE! For over sixty years Seccotine has been indispensable to every handyman. For sheer adhesive power buy Seccotine with the efficient new "pop-on" seal and open-nozzle tube ready for use.

SECCOTINE

STILL ONLY **1/3** PER TUBE

Sole Manufacturers — **McCAW, STEVENSON & ORR LTD., BELFAST**

Be Up-to-date!!

Use our Club facilities to book—or reserve, sets or new lines. We guarantee any order booked for new lines of *any* manufacture will be given A.1 priority and despatched immediately they are available.

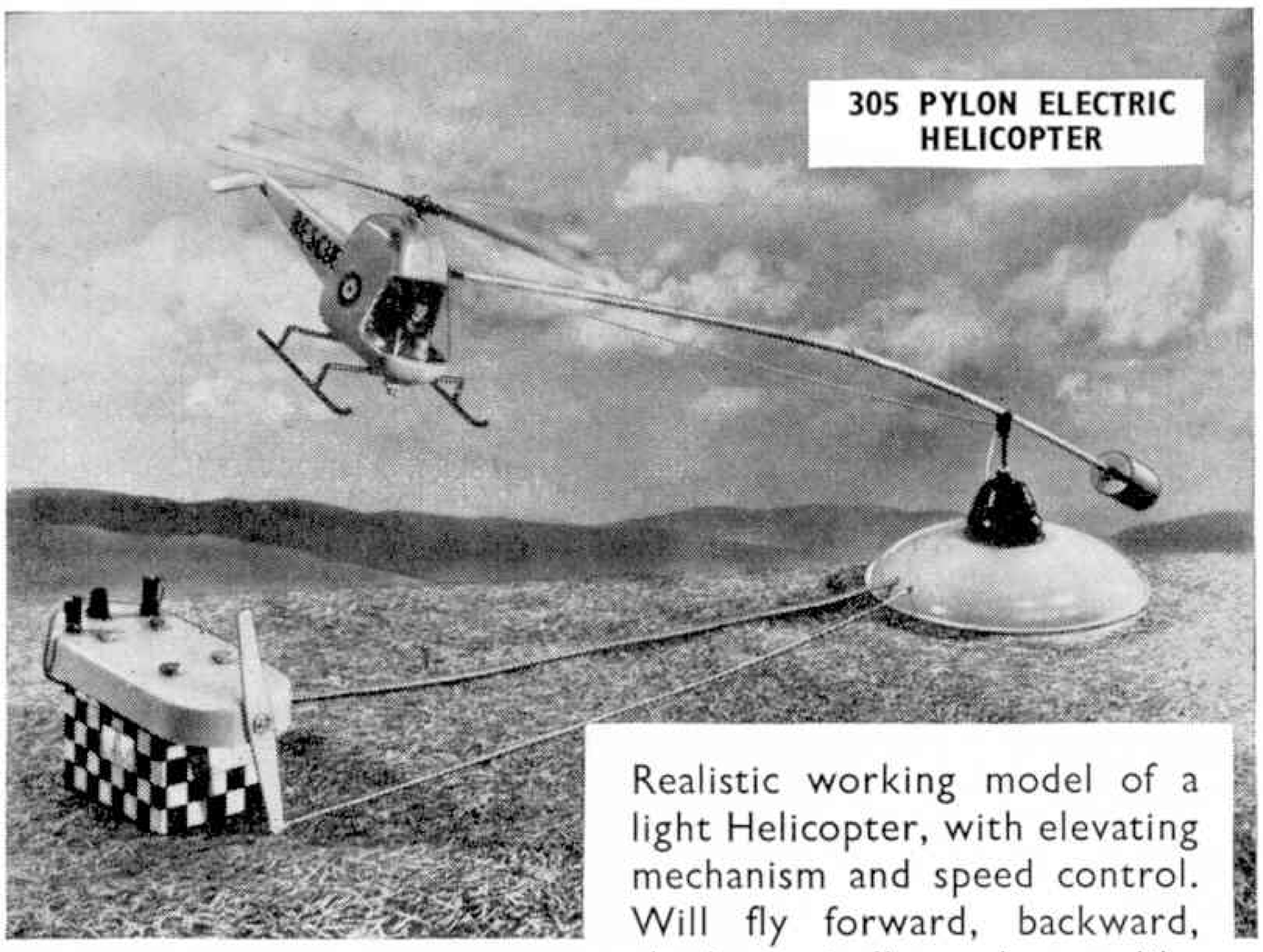
At this time of the year we have some excellent second-hand Rolling Stock and Accessories from our part exchange system—many items only a few weeks old. Let us know your requirements—no doubt we can help.

If in Yorkshire this summer—be sure to call—we have a surprise for visitors.

THE MODEL RAILWAY SPECIALISTS

KING CHARLES SPORTS CENTRE
(Near SCHOFIELDS)
Railway House
King Charles Street, Leeds 1
Tel.: Leeds 26611

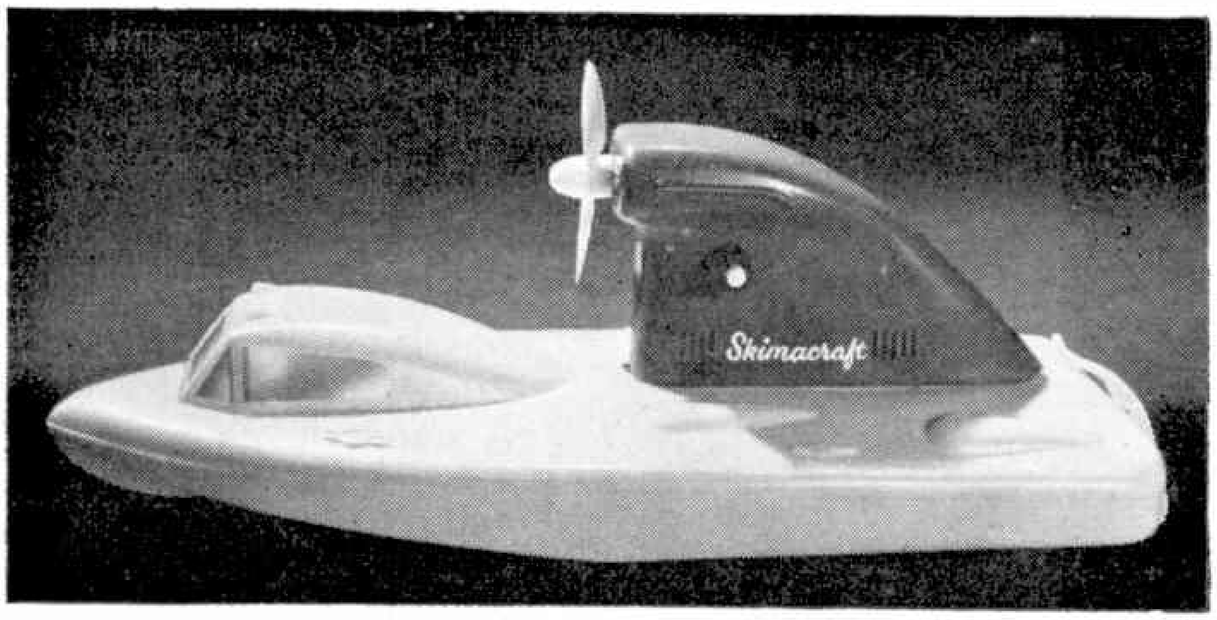
These are no **ORDINARY** models!



Realistic working model of a light Helicopter, with elevating mechanism and speed control. Will fly forward, backward, climb vertically or hover, like the real aircraft. Battery operated. Finished in contrasting colours, complete with miniature loads for carrying. **49/6**



But real, WORKING models of wonderful novelties like the Helicopter and Skimacraft runabout illustrated here. You'll be amazed at their powerful performance and will really "go" for their colourful, detailed appearance. Ask your local Stockist to show you these and other fascinating Tri-ang models available.



409S 14 in. "SKIMACRAFT"

Electric powered airscrew driven runabout of novel design. Unbreakable watertight polythene hull. Fitted with powerful electric motor, running on $4\frac{1}{2}$-volt torch battery. **17/6**

Made in England by

INTERNATIONAL MODEL AIRCRAFT LTD.

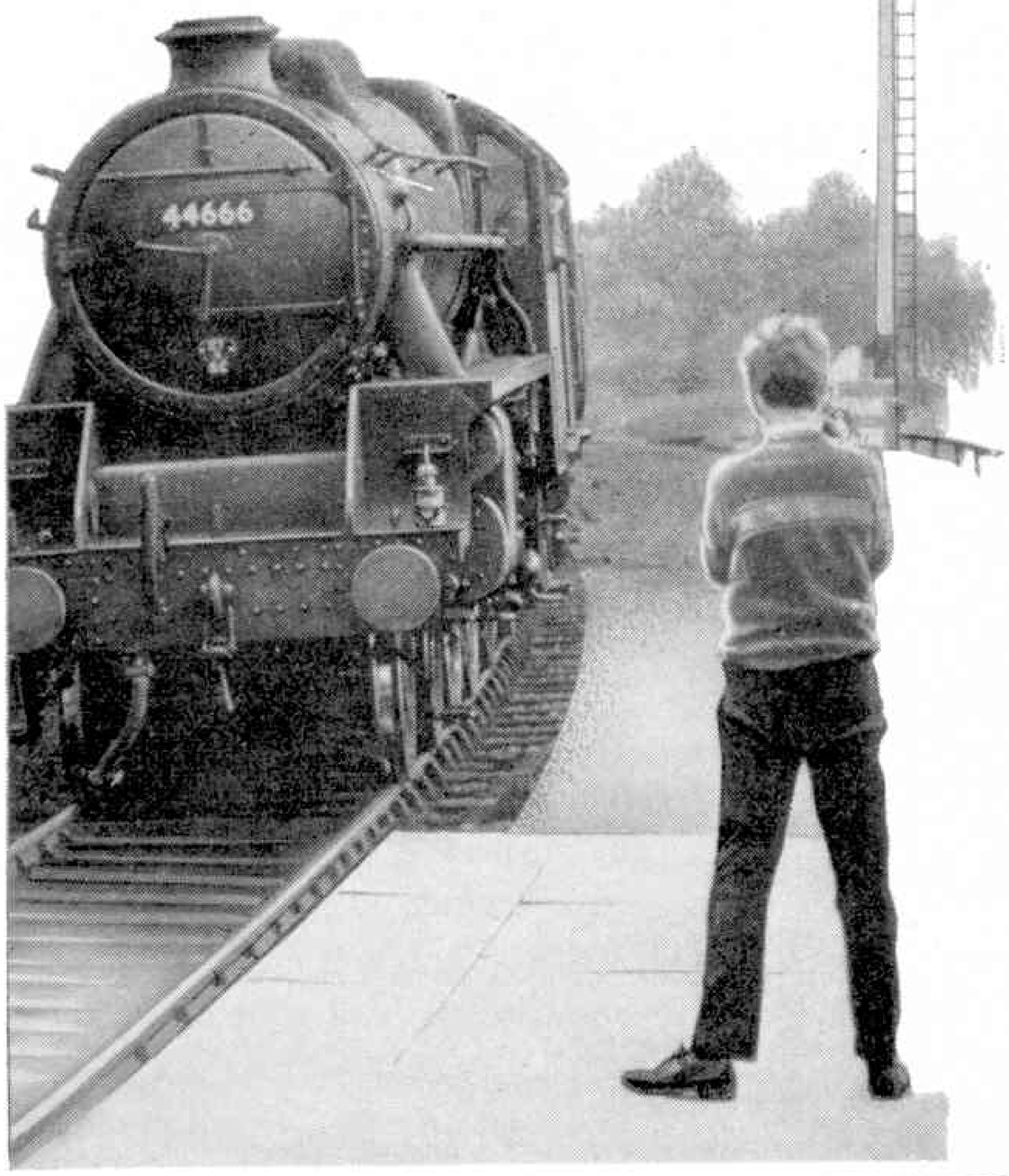
Morden Road, Merton, S.W.19

(A member of the Lines Bros. Group)

Tri-ang

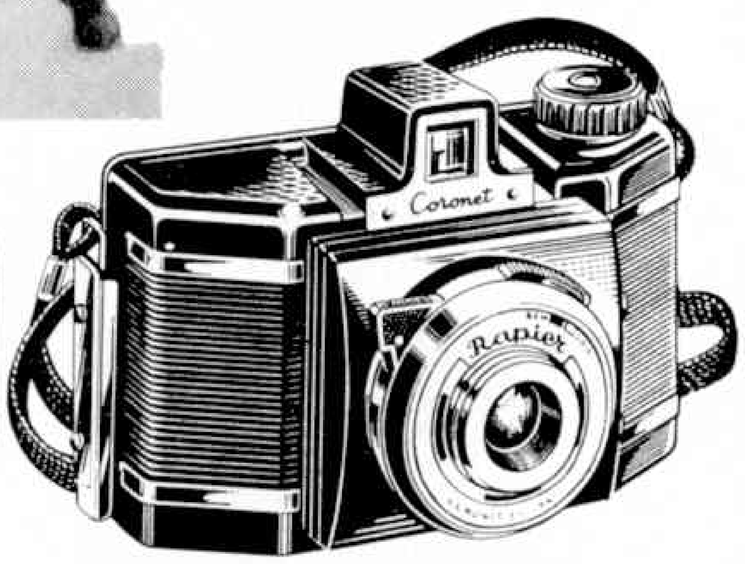
REG'D TRADE MARK

start train snapping with a coronet CAMERA



It's so much more exciting to make a permanent pictorial record of your train spotting activities. Taking wonderful shots of fast moving trains and impressive pictures of standing engines raising steam — adds so much more to your hobby.

45/1 Rapier



Money saver — 16 pictures on any 120 roll film. Optical viewfinder, two stops — one for colour, one for black & white and flash synchronised.

70/3 Viscount



A wonderful camera — two speeds 1/30th and 1/100th, two apertures f8 and f16, eye-level viewfinder. Gives 8 colour or black & white exposures on 828 roll film.

Supplied by Photographic Dealers, Chemists, Opticians, Co-ops and Mail order Organisations.

CORONET LTD., SUMMER LANE, BIRMINGHAM 19

x

MECCANO MAGAZINE

Volume XLVI **No. 8** **August 1961**

Registered at the G.P.O., London, for transmission by Canadian Magazine Post.

EDITORIAL AND ADVERTISING OFFICES:
LIVERPOOL 13, ENGLAND.
Telegrams: "Meccano, Liverpool."

Editor:
GEOFFREY BYROM

Asst. Editor:
ERNEST MILLER



Hornby-Dublo Enraptures Russia's Youth

WITH other leading British manufacturers, Meccano Limited made history a few weeks ago when the firm exhibited its products at the British Trade Fair in Moscow. Three members of the staff from Meccano Headquarters at Binns Road made the trip by air, travelling on the last leg of their outward journey direct from Amsterdam to Moscow in one of Russia's famous Tu.104 airliners. At the company's display stand at the exhibition, they demonstrated to admiring thousands Meccano itself, Hornby-Dublo Electric Trains, Dinky Toys, Hornby Speed Boats and Bayko. And a wonderful reception they got. Our editorial picture this month was taken at the exhibition and you can see the look of fascination on the faces of the Russian boys who pushed to the front of the Meccano stand to watch Hornby-Dublo Locomotives going through their paces. The display is described for you in this issue by Meccano's Export Manager.

Also inside this month's Magazine you will find an article on an object which is so common that it is scarcely ever written about; or at least it seems like that. It is the ordinary pencil which is so much a part of everybody's everyday life. When I was a youngster, one of the jokes going the rounds was, "You can take a horse to water, but a pencil must be lead." It brought quite a chuckle and yet, I suppose, very few people who used it as a quip ever realised how much there is of interest in the story of the ordinary blacklead. I am sure you will enjoy the article about it on page 301.

In spite of the rush of modern life, reading is still an important and popular pastime. Next month's *Meccano Magazine*, which will be a 60-page issue, will contain a special page of book reviews.

THE EDITOR.

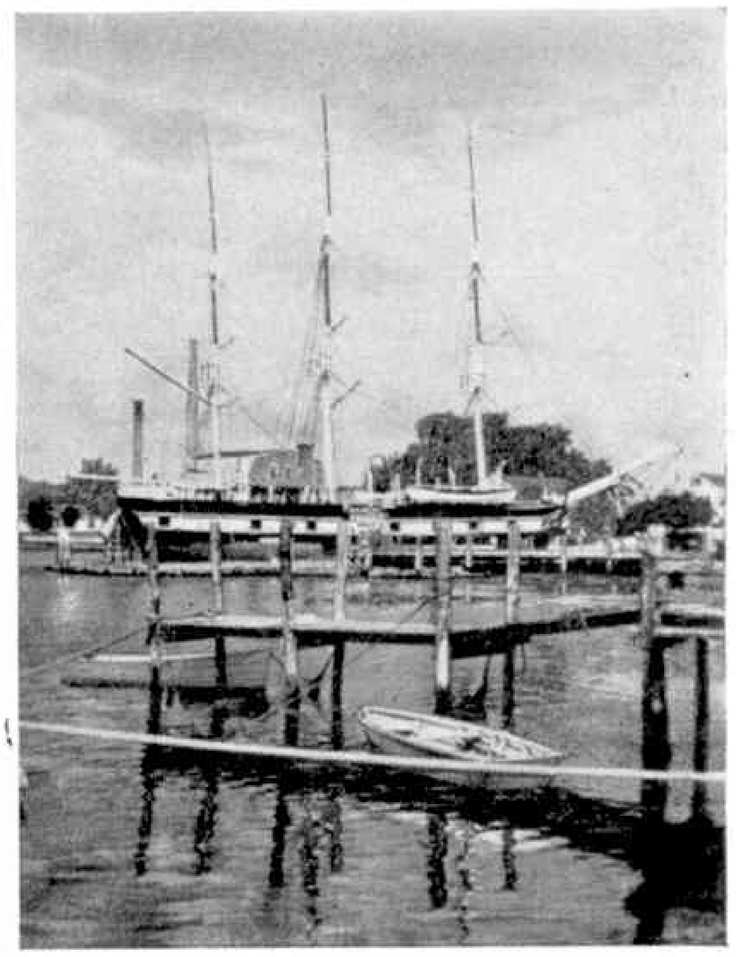
Next Month: THE FABULOUS FLAAM LINE

THIS MONTH'S CONTENTS INCLUDE—

	Page
POWER FROM NIAGARA.. .. By H. McDougall	270
FLIGHT TEST CENTRE .. .. By John W. R. Taylor	272
THE ELEMENT BORON SHOWS ITS PACES .. .. By M. Schofield, M.A.	278
THE TEA AND SUGAR SPECIAL.. By H. G. Forsythe	282
LEARNING TO DRIVE —AT SCHOOL .. .. .. By Ian Balderstone	294

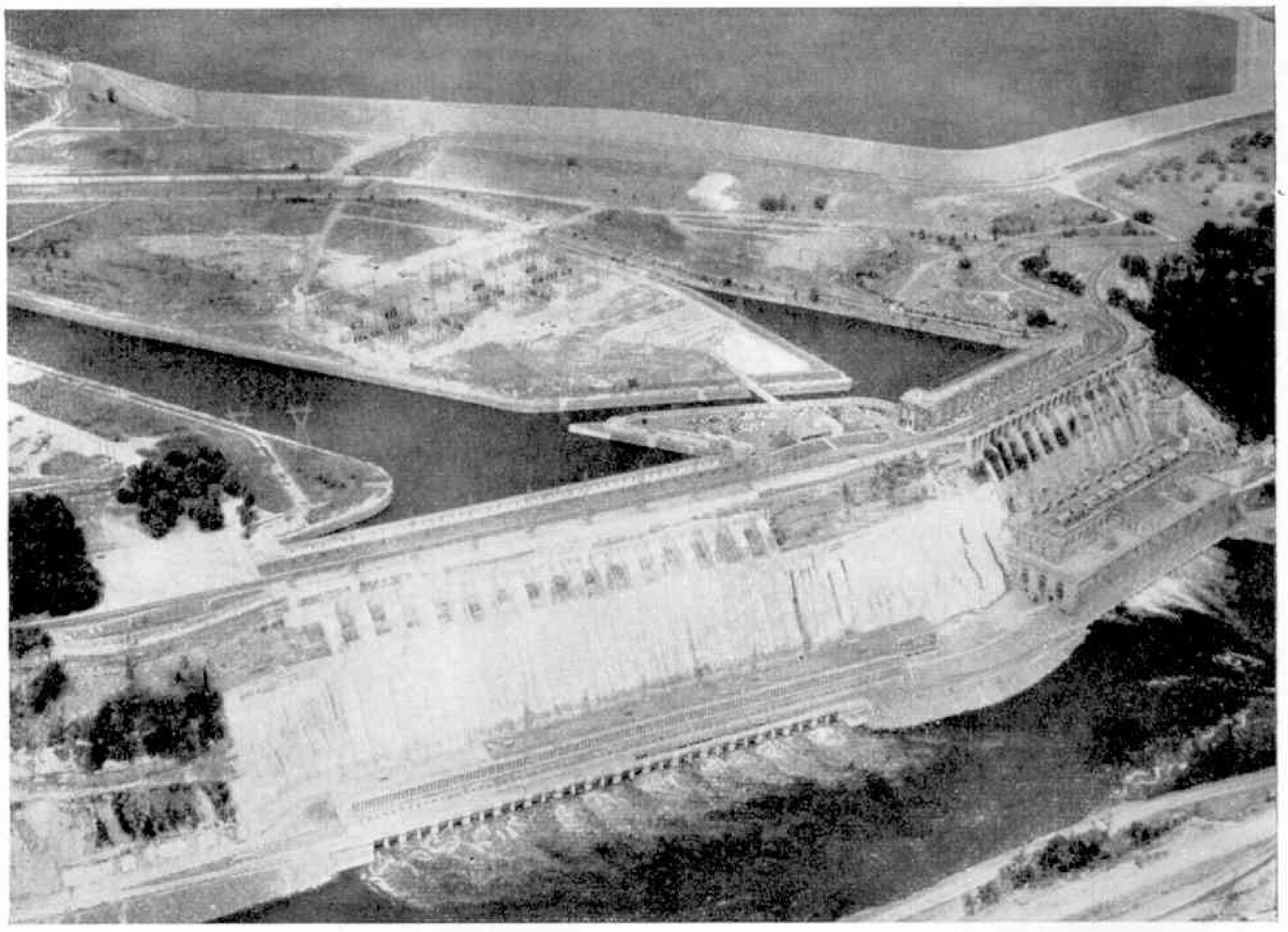
OUR FRONT COVER

Most people have read the story of "Moby Dick", or have seen the picture of that name either in its modern version or as it was in the era of the silent film. Our front cover this month takes us back to the days of fearless whalers such as those who figured in that epic tale. It shows the waterfront at Mystic, Connecticut, one of the New England ports from which those intrepid sailors made their long voyages. Elsewhere in this issue Sidney Allinson, whose article "Florida's Lost World" in the "M.M." of last July was so much appreciated by readers, writes in fascinating fashion about those exciting days.



Power From Niagara

By
HARRY McDOUGALL



An aerial view of the Sir Adam Beck Niagara Generating Stations. Generating Station No. 2 is on the left and the older plant on the right. In the upper centre of the picture is the 750-acre reservoir and the pump-generating station. This photograph and others illustrating this article appear by courtesy of Ontario Hydro.

NIAGARA is without doubt one of the world's most majestic sights. A less well-known fact is that it is also one of the world's greatest sources of hydro-electric power. The Niagara River is only 35 miles long, but during its short course it drops a total of 326 feet, and much of this spectacular plunge is concentrated in an eight-mile stretch of falls and rapids. The upper reaches of the Niagara River, just after it has left Lake Erie, are broad and placid, and even after the river has wandered a distance of 20 miles, it has dropped only ten feet. Then suddenly it breaks into rapids and drops 55 feet in one mile before reaching the Falls themselves.

The river then splits into two, about a tenth of the water flowing over the American Falls, which are 167 feet high and 1,000 feet wide. The remaining nine-tenths of the water falls over the Horseshoe Falls, which have a crest length of 2,200 feet and a drop of 162 feet.

The Falls themselves, however, account for only a portion of the descent of the river. After leaving the foot of the Falls, the water flows over a series of rapids which descend a further 52 feet in about one mile. An average of more than 200,000 cubic feet of water per second makes this descent; thus the potential for the generation of hydro-electric power has always been enormous.

The first power station to be built on the Canadian side of the river was erected in 1893. It was a small, 2,200 kilowatt station, installed just above the Horseshoe Falls, and its output was used to operate an electric railway line which ran along the banks of the river. Shortly after the turn of the century, three large generating stations were built almost simultaneously on the Canadian side. About that time the Ontario Provincial Government realised that Canada was on the threshold of tremendous industrial expansion, and that low-cost electricity could be very effective in providing the power for this expansion. And so the Hydro-Electric Power Commission of Ontario was formed to develop and control the water resources of the province. The Commission now supplies 90 per cent. of the electricity used in the province.

The Commission began, in 1917, what eventually became the biggest hydro-electric power plant in the world at that time, and it is still in operation. This station is known as the Sir Adam Beck Niagara Generating Station No. 1, and through the years it has been expanded considerably. It now has a capacity of 441,000 kilowatts and an average operating head of 295 feet. The first generating station utilised only the drop of the water adjacent to the Falls and did not take advantage of the further drop of 90 feet between the foot of the Falls and the village of Queenston, several miles downstream. To use the maximum drop, Ontario Hydro replanned the operation so as to divert water from the river two miles above the Falls and use it to drive turbines in a generating station eight miles downstream. This scheme involved the development of a waterway with an overall

The first Niagara Power Plant (1893).



length of 12½ miles, passing around the city of Niagara Falls from a point two miles above the Falls to a generating station on the lower Niagara River about one mile south of the village of Queenston. A canal 8½ miles long was excavated and used in conjunction with four miles of the Welland River.

Because water directed for power production obviously cannot pass over the Falls themselves, any really serious diversion would detract from the beauty of the Falls, and neither Canada nor the United States would tolerate this situation. Accordingly, in 1909, Great Britain and the U.S. signed the Boundary Waters Treaty under which it was agreed that the daily aggregate of water diverted for power purposes was not to exceed 56,000 cubic feet per second. This quantity was almost entirely accounted for by the power stations that were subsequently built, so, after the effects of further diversion had been carefully studied, a new agreement was signed between Canada and the United States, in October 1950, which greatly increased the amount of water available for power production. This pact —the Niagara Diversion Treaty—was intended to protect the scenic values of the Falls themselves, and it specifies that the flow over the Falls shall not be less than 100,000 cubic feet per second during the daylight hours of the tourist season, nor less than 50,000 cubic feet per second at any other time.

As soon as the agreement was ratified, Ontario Hydro's construction forces began work on a huge project more than three times as great as the earlier Sir Adam Beck development. This new generating station, which adheres to the same fundamental plan as the first, makes use of as much of the available river drop as is economic. The new generating plant itself is, in fact, close to the old one. However, instead of planning for it to be fed by an open canal it was decided, after analysing the costs involved, to substitute tunnels. These permit the water to take a route five miles shorter than the open waterway.

Separate intakes are provided, above the Falls, for each tunnel. Each consists of a concrete structure 500 feet long, parallel to the bank of the river. Water enters through slots in the vertical face of the gathering tubes, the tops of the slots being below the normal river level as a precaution against becoming blocked by ice. The parallel tunnels are 5½ miles long and have a finished diameter of 45 feet. They are lined with concrete and, for much of their length, pass, at a maximum depth of 330 feet, beneath the city of Niagara Falls. Each is designed to carry 20,000 cubic feet of water per second, and the water eventually discharges into an open canal, joining the normal supply being fed to the older station. Thus, the single, greatly-increased supply of water is available to both of the power houses.

The head structure of the new plant is 875 feet long. There are two openings for each of the sixteen penstocks, the flow through which can be shut off by remote control from the power house in an emergency. The penstocks of the new plant are steel tubes, 19 feet in diameter and 500 feet long. They were installed in shallow trenches cut in the face of the cliff, at an angle of 60 degrees from the horizontal for most of their length. Each penstock was built of 68 prefabricated rings which were put into position individually, welded, then encased in concrete.

A great deal of the loose rock which had to be taken from the face of the cliff before work could commence was used to form a coffer dam along the shoreline, in front of the power house site, the dam rising to a height of 35 feet. This considerably simplified the construction of the power house by permitting the work to be carried out "in the dry", and the dam was later removed by blasting and dredging.

The new plant houses sixteen generating units, compared with ten in the old plant, and is almost twice as long. Power is generated at 13,800 volts, and it is stepped up to 230,000 volts by the main transformers immediately behind the power house structure.

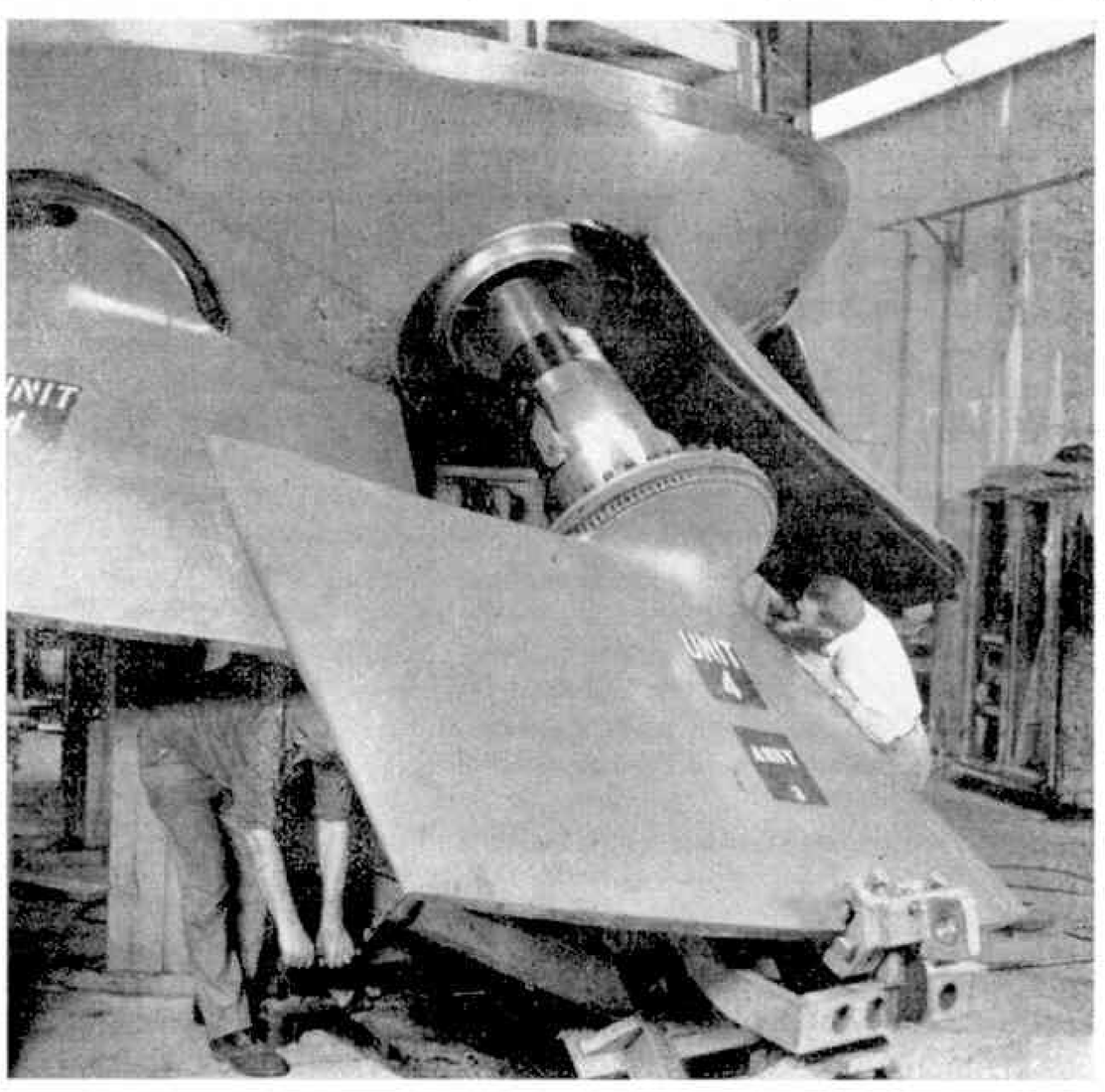
The new station, together with an associated pump and generating station, has an installed capacity of 1,370,000 kilowatts, bringing the combined capacity of all Ontario Hydro's Niagara River plants to more than 2,000,000 kilowatts, which is more than that provided even by the vast new St. Lawrence power development.

One of the difficulties involved in the distribution of hydro-electric power is that electricity cannot be stored on a large scale. Since the demand for electricity fluctuates widely, the problem of ensuring an adequate supply when needed has been solved at Niagara by an ingenious scheme involving the storage of vast quantities of water for use at peak periods of power demand. It consists of a reversible flow canal which connects into the existing power canal system, a pumping-generating station, and a man-made storage reservoir.

When the demand for power is lowest, six units of the pumping-generating station are reversed and used as pumps to fill the man-made reservoir. This great basin of almost 750 acres has a capacity of 650 million cubic feet of water. When a period of high demand (*Cont. on page 306*)

Below: This sectional picture shows work in progress during the construction of one of the tunnels used in the new scheme. Right: A novel type of reversible feathering blade pump-turbine developed especially for the Niagara power project by the English Electric Company. The photograph shows assembly in progress.





FLIGHT TEST CENTRE



WE usually think of test pilots as men who clamber aboard new and untried aeroplanes, streak up to a great height and then put the aircraft into a screaming full-power dive to see if the wings will stay on. Such flights are sometimes necessary; but most of the flying life of a modern test pilot is devoted to what is known as development flying. This may involve taking up the same well-proven aeroplane day after day, to measure with great accuracy its performance at different speeds and heights, in all kinds of weather and with varying payloads.

It is often monotonous; but excitement and danger are never far away, for even the most routine flight can reveal some unexpected weakness in airframe or engine that will test to the utmost the skill and courage of the pilot.

No pilots require greater ability than those who fly for engine manufacturers. They seldom make news like their colleagues who are responsible for the first flights of spectacular new fighters or jet airliners. But whereas the latter might have only one main type of aircraft to fly for years on end, those who test aero-engines may have to take up a giant delta-wing bomber one day, a trainer the next and a turboprop airliner a few days later.

By

John W. R. Taylor

Nor is the job any less important or adventurous than that of the "airframe" pilots. Any aeroplane is only as good as its power plant, and the only way to ensure that a new aero-engine will give the required output for hundreds, or even thousands, of hours between overhauls is to work it hard on the test bench and in the air, long before it enters military or airline service.

As part of this testing, the aeroplane fitted with the new engine must sometimes be flown deliberately into towering storm-clouds to see if the engine will ice up and stop working. If it does, in a cloud that might contain violent winds, driving sleet and lightning, the situation is far from amusing.

Because of all this, the Flight Test Department of Bristol Siddeley Engines Ltd., at Patchway Works, Bristol, is a far more interesting place to visit than most company aerodromes.

* * * *

It has so much work in hand, following the amalgamation of the former Bristol and Armstrong Siddeley engine companies, that a huge new hangar has had to be built to house the dozen or so aircraft that are under test at any one time. The extent of this work is best illustrated by the variety of the test-bed aircraft rather than their number.

It is not possible to describe everything that is happening at Patchway, as some of the engines and equipment are intended for future military aircraft that are still highly secret.

Towering over the small machines in the hangar are two Vulcan bombers being used to test powerful new marks of Olympus turbojets. They remind us immediately of how continuous engine development can improve the efficiency and performance of an aeroplane. The original Vulcan B.Mk.1 had four 11,000 lb. thrust Olympus 101 engines, which were followed by 12,000 lb. thrust Mk.102s and 13,000 lb. thrust Mk.104s. It was the finest bomber of its type in the world; but the present Vulcan B.Mk.2 has 17,000 lb. thrust Olympus 201 engines and will fly at just below the speed of sound at far greater heights than the Mk.1. With engines of even greater power, it will remain a world-beater right through the 1960s, carrying new weapons like the Blue Steel stand-off bomb and the Skybolt air-launched ballistic missile, and protected by radar-jamming electronic gear in its bulged tail-cone.

Another V-bomber is to be used for flight testing secret lift-thrust engines, similar perhaps to that which enables the



A member of Bristol Siddeley's Flight Test Department is seen examining, on a film reader, the recordings taken from an Automatic Observer Panel.

Hawker P.1127 strike fighter to take off and land vertically like a helicopter, and yet make ground-level attacks at well over 700 m.p.h.

Side by side with these large aircraft in the hangar at Patchway are a Javelin all-weather fighter with Bristol Siddeley Sapphire engines, a Sapphire-powered Canberra with a pod under its starboard wing for high-altitude flight testing of the Viper 11 turbojet, and two Jet Provosts with Viper 8 and 11 engines respectively.

The oldest aircraft in regular use is an Ashton, which is employed mainly on Olympus development. The present fleet is completed by two Orpheus-powered aircraft, a Gnat and a Gnat Trainer, and a Gannet which has a Double Mamba turboprop in a rather bulky cowling.

Although there are no more aeroplanes at Patchway, a good deal of additional flight test work on Bristol Siddeley engines is done at Government and industry establishments, on the actual prototypes of the aircraft for which the engines are destined.

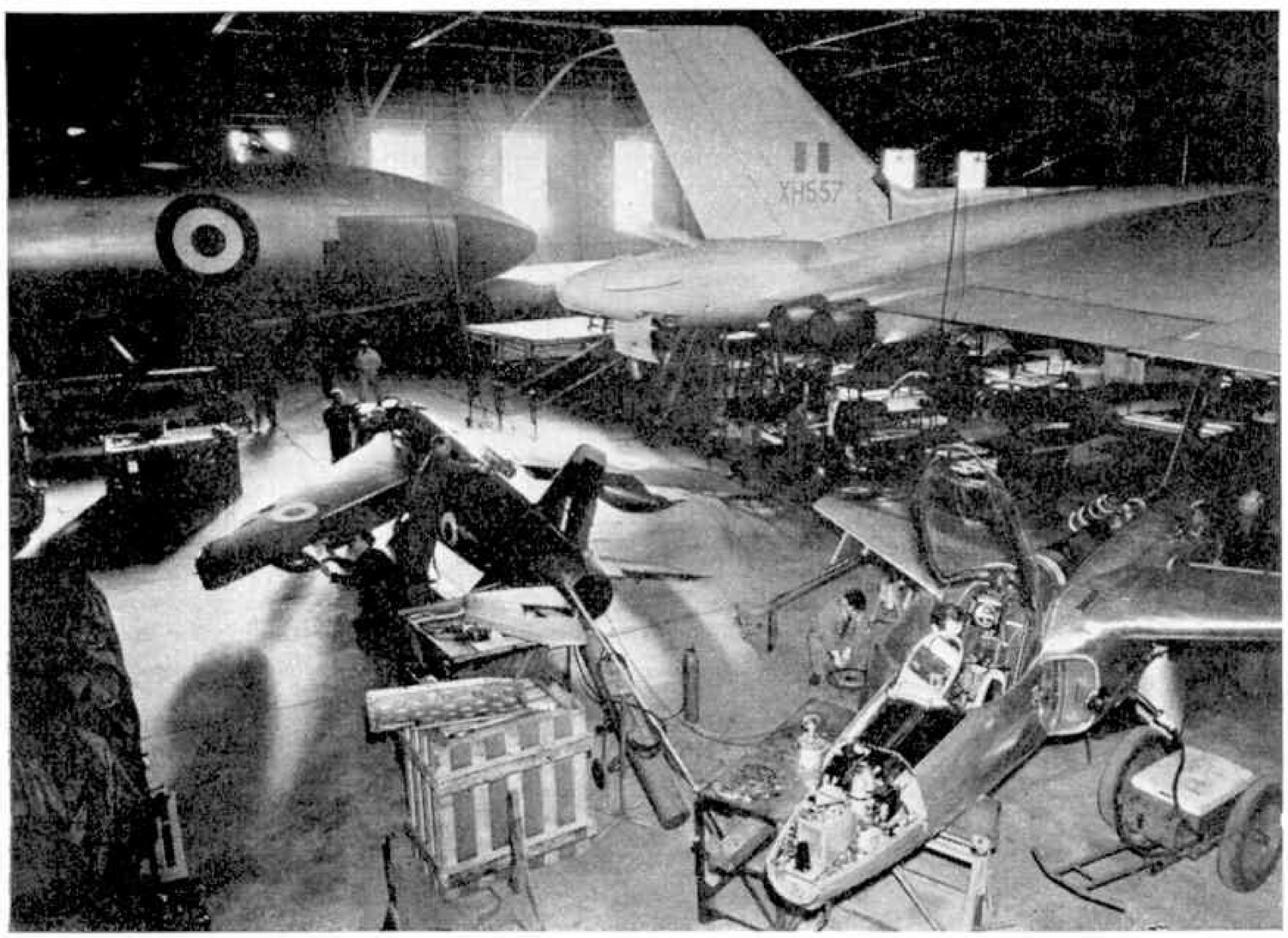
To fly all these machines the company has six test pilots, to whom must be added about two dozen flight test engineers and a large ground crew. Needless to say, all these men must work closely together, as a team.

Far from being a free agent, planning his own test programme and simply jotting down notes on a knee-pad in flight, the modern test pilot must stick rigidly to the testing sequence worked out by the technicians. Unlike his "helmet and goggles" brother of 30 years ago, he is not expected to produce all the answers himself. In fact, most of the information required is collected automatically by recording equipment stowed aboard the aircraft. Sometimes this includes telemetry gear, which radios the data to recorders on the ground while the test flight is in process.

In spite of this, the pilot is still the most important part of the pattern. He must fly with far greater precision than test pilots of the past if the highly-accurate recording apparatus is to do its job properly. The question of expense also enters the picture, for a large jet-plane might cost hundreds of pounds an hour to fly, so that a test flight that failed to produce the required data would represent a serious financial loss. Another factor which is easily overlooked is that every single hour of flying may well require 50 hours of work by a technician in the way of preparation and analysis of the results.



One of the Bristol Siddeley test pilots (left) makes a last-minute check before a flight. Below: To cater for the aircraft there, a new hangar is among recent extensions at Patchway.



* * * *

In general, engine testing has to provide three kinds of data, covering performance, handling and mechanical reliability—the qualities on which the reputation of the engine will ultimately depend. A typical item of information that must be known is the greatest height at which an engine will re-light (re-start) safely if it has stopped during flight. It is easy to see why this is important in the case of a military aircraft like the Lightning or Gannet, because it is possible to extend the endurance of these types by shutting off one of their two engines in cruising flight. If the shut-down engine failed to re-light at the moment an enemy fighter came into view, the result might be highly dangerous for the pilot.

Let us, therefore, follow what happens in a test flight to check the re-lighting capabilities of a new engine. The test-bed aircraft, a Javelin, is already taxying out for take-off, so we must hurry over to the control tower, where we shall be able to hear what the pilot reports over his radio during the test.

The flight test engineer has told him to climb to 40,000 feet and stop his starboard engine. "Starboard engine cut", says the distant voice that crackles over the loud-speaker in the control tower. We now wait, excitedly, while the Javelin descends slowly to 38,000 feet with the compressor of the shut-down engine windmilling in the airflow.

"At 38,000 feet. Starting to re-light . . . Re-light successful."

Calmly, the flight test engineer notes the exact height and speed at which the re-light was made, while the pilot climbs back to 40,000 feet for the next test. This time the re-light is again to be attempted at 38,000 feet but at reduced speed. If it is successful, it will be followed by a third test, at the same speed but at a lower altitude; then by further tests, providing a whole series of readings at intervals of 500 to 1,000 feet altitude and five to ten knots airspeed.

Armed with these figures, the engine's designers will know whether its re-light performance is satisfactory, or whether changes must be (*Cont. on page 306*)

Final Test On The Consul Classic

The Trials That Confront A New Car



A final analysis of the Consul Classic 315, to extend and re-check the findings of world road testing, was carried out in the Ford Anechoic Laboratory, at Dagenham.

FEW people realise what rigorous trials are carried out before a new car goes into production—trials that are designed to make or break the model before it reaches the showrooms.

The Ford Classic 315, first British car in the medium price range with disc brakes, covered well over a million miles on test during the two years preceding its public appearance. In Africa, one of the prototypes was thrashed for 23,000 miles across desert and through the bush at an average speed of 52 m.p.h., a remarkably high average for a family car over such a tough route, and in temperatures often approaching 100 degrees Fahrenheit. In Sweden, another Classic prototype was put through its paces in temperatures as low as 42 degrees of frost, while other prototypes were driven flat out for thousands of miles over the German autobahn system.

At Dagenham, where Ford technicians in the design-engineering centre are able to reproduce climatic conditions far more severe than any likely to be encountered in normal service, the engine, brakes, transmission and steering of the Classic were tested exhaustively. For instance, a gearbox was encased in a block of carbon-dioxide, which subjected it to 82 degrees of frost, so that the durability of gearbox oil seals in cold climates could be established. Then the engine was started and first gear selected, and, after the engine had been started countless times under these conditions, the oil seals were removed for examination and passed as satisfactory for production.

PETER LEWIS
writes about events in the motoring world

The steering column gear selection linkage (and an excellent steering column change it is) was tested continuously for several months. An engine, gearbox and gear shift assembly were mounted on special equipment which, with the engine running, changed the gears mechanically many thousands of times a day.

With a million road test miles logged, and numerous tests carried out similar to those I have described, Ford engineers then carried out a final analysis of the Classic in the "Anechoic" laboratory at Dagenham, a view of which you see on this page. It is a specially constructed building with sound-absorbing floor, walls and roof where—in surroundings that are absolutely echo-free—any kind of "road" can be brought to the vehicle with infinite variations of load, speed and gradient. Elaborate instruments record noise, vibration and stress factors in all parts of the structure.

There is no doubt that the new Classic 315 will be a world-beater but I have only driven one for a few laps of the Brands Hatch circuit on Press Day, and I propose to make a full road test before writing about this exciting new car in *Road and Track*.

The 3-litre Alvis—a thoroughbred with a sporting performance. This is the coupé version.



THE R.A.C. T.T.

The R.A.C. Tourist Trophy Race at Goodwood, on August 19, promises to be a closely fought race, for there will be at least three E Type Jaguars to challenge Stirling Moss, who will probably drive a Ferrari-Berlinetta entered by Rob Walker. As in 1960, when Moss won at an average speed of 85.58 m.p.h. with a Ferrari, it is once again a Grand Touring race and will last for three hours. Next year the World

Racing Personalities

MIKE PARKES



Mike Parkes. His advice to new drivers, "Build up your experience little by little each year."

FOR many years Team Managers have been able to find promising drivers from among the scores of amateurs who race every week-end at club meetings. Some club drivers remain amateurs; others are soon marked down as possibles, while others again take it easy and progress over a number of years.

Twenty-nine-year-old M. J. Parkes—the son of J. J. Parkes, Chairman of Alvis—is a very good example of the progressive approach; for although Parkes did not make the headlines until this season he has been, in his own words, "racing on and off, since 1950."

Mike Parkes, who in five months of the current season has firmly established himself as a skilful and versatile driver, pays tribute to the invaluable experience gained during ten years of club racing (his first race was at Silverstone with a vintage Frazer-Nash) and to what he learned from the F.2 Fry-Climax in 1958 and 1959. He handled the F.2 car so well that he found himself at the wheel of Sir Gawaine Baillie's Lotus Elite in 1960 in three races of international status—the Le Mans classic, the T.T. and the tough, exacting 1000-Kilometre Race at the Nurburgring.

Parkes is more than grateful for the opportunities Sir Gawaine Baillie gave him, for, as a result of his showing with the Elite, he became a member of T. Sopwith's Equipe Endeavour in 1961. At Goodwood, on Easter Monday, Parkes won the G.T. race in a Ferrari-Berlinetta, beating both Moss and Ireland in Aston-Martins. Earlier he had humbled Salvadori and Graham Hill by winning the saloon car race in a 3.8 Jaguar.

At Oulton Park, Aintree and Silverstone, Parkes continued his steady progress, and then on the fast, dangerous, "drivers' circuit" of Spa, in Belgium, he drove Sopwith's E Type Jaguar and took second place in the G.T. race. He followed up this fine performance with a victory in the G.T. race, again in the Berlinetta, at Brands Hatch at the expense, once more, of Salvadori and Hill.

It was no surprise when Enzo Ferrari invited Parkes to drive for the works team at Le Mans, for the Englishman had been marked down as a possible after his handling of the Ferrari-Berlinetta at Goodwood and Brands, and a Sunbeam Alpine at the Le Mans Trials in April. He drove a 3-litre, V.12 sports (*Cont. on p. 306*)

Sports Car Championship will be for G.T. cars instead of for open sports cars and this month's T.T. will give us a preview of the E Types in action over a fairly long distance.

The race, which starts at 3 p.m. and follows the heats and final of the Formula Junior Championship, will be run in three classes and I shall be surprised if the works Porsches do not dominate the 1300–2000 c.c. class, while the 1000–1300 c.c. class should be a Lotus-Elite benefit. The big question mark is whether or not the E Types—one driven by Salvadori who put up the fastest lap in last year's T.T., in an Aston-Martin, at 89.81 m.p.h.—can turn the tables on Ferrari.

THE WORLD CHAMPIONSHIP

What a great pity that British cars have had to be raced this season without a new Formula 1 engine to meet the challenge from Ferrari and Porsche, particularly the Italian cars. It is entirely our own fault, for the new 1½ litre formula was announced at the R.A.C. in London in October 1958 and, while we chose to fight the introduction of the formula, the Italians and Germans accepted it and promptly set about designing and building a suitable engine.

The consequences have been far-reaching, particularly for Stirling Moss who has driven magnificently this season. With an engine as powerful as the new V.6 Ferrari power unit, Moss would almost certainly have won the World Championship this year. All credit to the Ferrari drivers—Hill, Von Trips and Ginther—who have done very well indeed, but on sheer driving ability this should have been Moss's year.

THREE-LITRE ALVIS

I enjoy driving a fast car, but not when the exhaust note is unduly noisy, and I welcomed the opportunity recently of driving the 3-litre Alvis saloon, for this superbly finished motor car provides swift, effortless luxury travel at speeds well in excess of 90 m.p.h. that is unbelievably quiet. After a lengthy journey in the Alvis, part of the way over winding country roads and part of the way on M1, I felt as fresh when I switched off the ignition as when I had started out. This is one of the most appealing features of a thoroughbred car, one of a long line—since the first Alvis was built in 1920—that combines sports performance with the graciousness of a Rolls Royce. For, make no mistake, the precision-engineered, 6-cylinder, twin-carburetter 2,993 c.c. engine of the Alvis is powerful enough to return some very impressive acceleration figures such as 0–50 in nine seconds (*Cont. on page 306*)

THE JOYS OF A HORNBY SPEED BOAT



Manipulating their Hornby Speed Boat on the pond at their home in Sevenoaks, Kent, are Timothy Gore (left) and his brother Brendon. The launch in the picture—one of three in the Hornby series—is the Twin Cockpit River Launch "Una". The two others are an R.A.F. Range Safety Launch and a Fast Patrol Launch.

MYSTIC SEAPORT RECREATES

THE GOLDEN AGE OF WHALING

EXCITEMENT tingles in the very air when one strolls along the waterfront of Mystic, Connecticut. The smell of the sea, and the spell of wooden sailing ships, combine in this little New England town to transport you back through time to the middle of the nineteenth century. Of all the places to visit, there is none better than Mystic in which to capture the adventure of the golden age of whaling. For riding at the wharf is a square-rigged whaling-ship, tarred, painted and straining to be off again to the South Seas and Antarctica.

Seaport Street, rambling along the dockside, is lined with strange old buildings that seem to have popped out of a history book. Signs over the bullseye windows read strangely to a modern glance—Apothecary Shop, Shipsmith, Sail-Loft, Ropeworks, Ship's-Chandler, Rigger, Woodcarver, Lobster-Shack, Counting-House, the Aloha Church—all are there, just as they were a century ago.

* * * *

Step aboard the whaler, *Charles W. Morgan*, only remaining vessel of her kind. You pace the holystoned deck and imagine being aboard her on one of her 37 voyages, when these same planks were slippery with the grim and greasy business of whaling.

Looking along the wharf, through the squared yards, rigging and masts of other sailing ships, you feel today's rushed, unromantic world recede further into the peace of these mellow surroundings.

It was a desire to produce this effect of recapturing the past which prompted the Marine Historical Association to re-create

By SIDNEY ALLINSON

Mystic Seaport on the banks of the Mystic River.

Some 30 years ago, this association was founded by local businessmen in an endeavour to preserve the proud maritime traditions and history of New England's coast. Fearing that some of the finest spirit of America might die with the passage of time, these farsighted men set about making an accurate, tangible record of those dauntless Yankee whalers of long ago. Those seafarers ranged from the Arctic ports of Russia to distant Sumatra and Tahiti, making voyages of four and five years' duration to bring wealth to the young, growing United States when wealth was desperately needed.

It was a glorious era for Mystic; the age when a prosperous merchant or captain might walk along Seaport Street followed by his Malayan servant in colourful robes, eager to supervise the landing of the latest cargo of Chinese otter-furs or sperm-whale oil.

The story of other New England seaports — Nantucket, New Bedford or Boston—was often told, but Mystic had fallen into disuse and her history lay among the rotting timbers of her deserted shipyards.

Work of reconstruction began slowly, but each facet of it revealed another epic of far voyaging. By 1941, its small museum was a thriving attraction, with its fascinating array of whaling implements, log books, ship-models and naval paintings.

It was at that time the association brought to the wharf the *Charles W. Morgan*, broad-beamed survivor of the age of wooden sailing ships. Battered as she was, stripped of paint, brass, rigging and spars, her refurbishing brought with it the sweeping idea of rebuilding the entire port.

* * * *

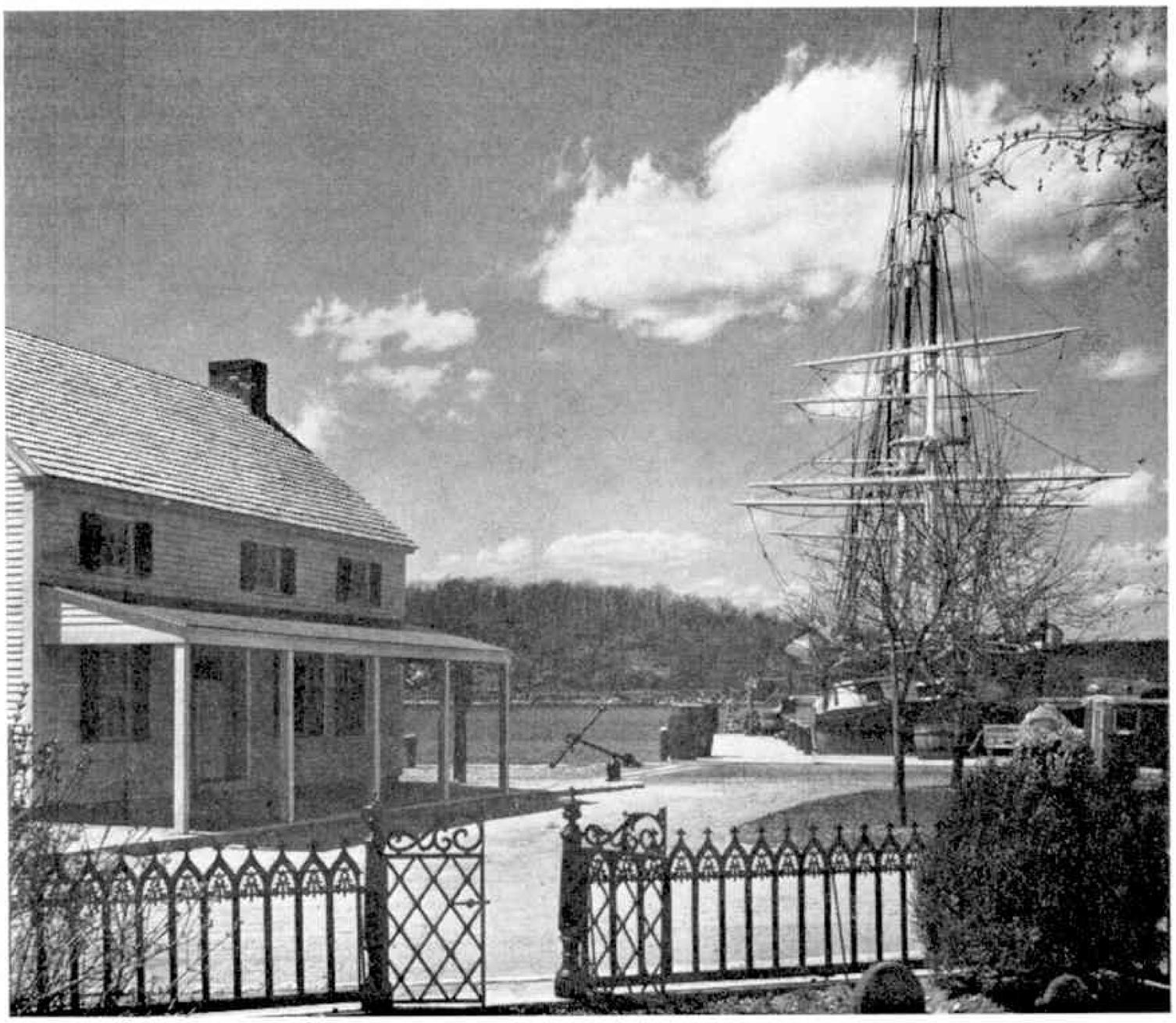
Today, a community thrives here in the environment essential to a seafaring town of the early 1840's. Grouped around the village green are original picturesque buildings—a tiny red schoolhouse, the general store, several small white houses, the Fishtown Chapel, Spouter's Tavern and the counting-house built in 1833.

Inside the weathered grey walls of the Stillman Building is housed a fine museum of nautical relics. Many treasures of whaler days are displayed there—ornate figureheads, brass-bound sea chests, razor-sharp flensing knives once used to dissect monster whales, log-books with drama recorded in every faded word, old cannons and dozens of models of whalers and clippers.

There are several especially beautiful examples of scrimshaw—that now-lost sailor's art of carving delicate engravings on whale-teeth.

Strolling on towards the masts and spars, that rise (*Cont. on page 306*)

Through the gateway of the old burying ground at Mystic the Spouter's Tavern is seen at the left. At right is the *Charles W. Morgan*—last of the old wooden whaling ships.



MECCANO GOES TO MOSCOW

By NORMAN CRAIG
(Export Manager, Meccano Limited)



At the British Trade Fair in Moscow Mr. Krushchev admires the exhibition by Meccano Limited which included Hornby-Dublo Electric Trains, Meccano and Dinky Toys. On Mr. Krushchev's right is Mr. Norman Craig, of Meccano Limited, and also in the picture are Mr. Mikoyan (extreme left) and Mr. Reginald Maudling, President of the Board of Trade (behind Mr. Krushchev).

"A CHILDREN'S paradise" was the comment of Premier Krushchev when he visited the display of Meccano Limited at the British Trade Fair held in Moscow during May and June. The display consisted of attractive layouts of Meccano Models, Hornby-Dublo Electric Trains, and Dinky Toys. One group of Meccano models stressed space-age developments and included models of two space ships, a rocket on its launching site, a rotating radar screen and a fine representation of the Jodrell Bank telescope. This group was looked upon as a compliment to Russian achievements in space and was considered both topical and timely.

In addition there were other models, including one of the Standard Triumph chassis which displayed, in realistic detail, many of the moving parts, particularly the transmission and the four-wheel suspension. This was, indeed, most effective as Standard Triumph were showing the real car elsewhere in the Fair.

GREATLY IMPRESSED

Another section which appealed to the many technically-minded visitors was a board of working Meccano Mechanisms showing a large variety of mechanisms and movements made possible by the use of Meccano gears. The accuracy and precision of these parts greatly impressed visitors to the Fair.

The Dinky Toys display consisted of an animated race track with grandstands, car parks, etc., and the varying positions of the cars on the two race tracks enthralled the visitors, young and old. By way of background there was an animated scene giving the impression of Dinky Toys travelling along a hillside road. The detail, strength and high finish of Dinky Toys were a never-ending source of surprise to the Russians.

The Hornby-Dublo display created so much attention that, in peak hours, the operation had to be suspended at frequent intervals in order to disperse the crowds and allow a passageway along the corridor in front of the stand.

The many Russian visitors found it hard to believe that models of such accuracy and fine finish were primarily intended purely as a hobby, and not to demonstrate some particular feature of British Railways.

When a slogan was mounted on the board saying, in effect, "This is the best hobby for boys of six to sixty", the humour appealed greatly to the Russian crowds, and also served to underline effectively the message that was being put over.

The Russian children were enraptured as they watched the train display, for it was something they had never seen before. Their reactions to the various operations, shunting, uncoupling, making up trains and mishaps, actual or near, were very similar to those of a crowd of youngsters in any other part of the world. And the adults loved it, too.

One feature which always produced a chuckle of delight was when the little 0–6–0 Tank Locomotive was brought bustling out of an engine shed to take over a line of goods vehicles previously hauled by a large diesel. This operation never failed to please the crowd who, one felt, had the same warm affection for this little locomotive as is usually reserved for the mischievous boy in a cinema comedy.

Displays were also made of Bayko Outfits and Hornby Speed Boats and these, too, attracted their full share of attention and admiration.

The demand for leaflets and booklets was on a scale never previously encountered in any part of the world. During the period of the Fair we distributed many thousands of items of printed matter, a large percentage of it specially printed in Russian, but in order to make this quantity cover the period of the Fair we had ultimately to restrict the issue to some three hours each day.

WILL NEVER FORGET IT

Certainly the million Russians who saw the Meccano display will not forget it and we, on our part, will remember the hospitality and help of the Soviet authorities, the friendliness of the Russian people and the wonders of the Kremlin, the Bolshoi Theatre and Ballet, and the Metro. The last-named, with its marble stations, and clean and efficient trains, deserves an article of its own.

(*Continued on page 306*)

SOME FACTS ABOUT THE FAIR

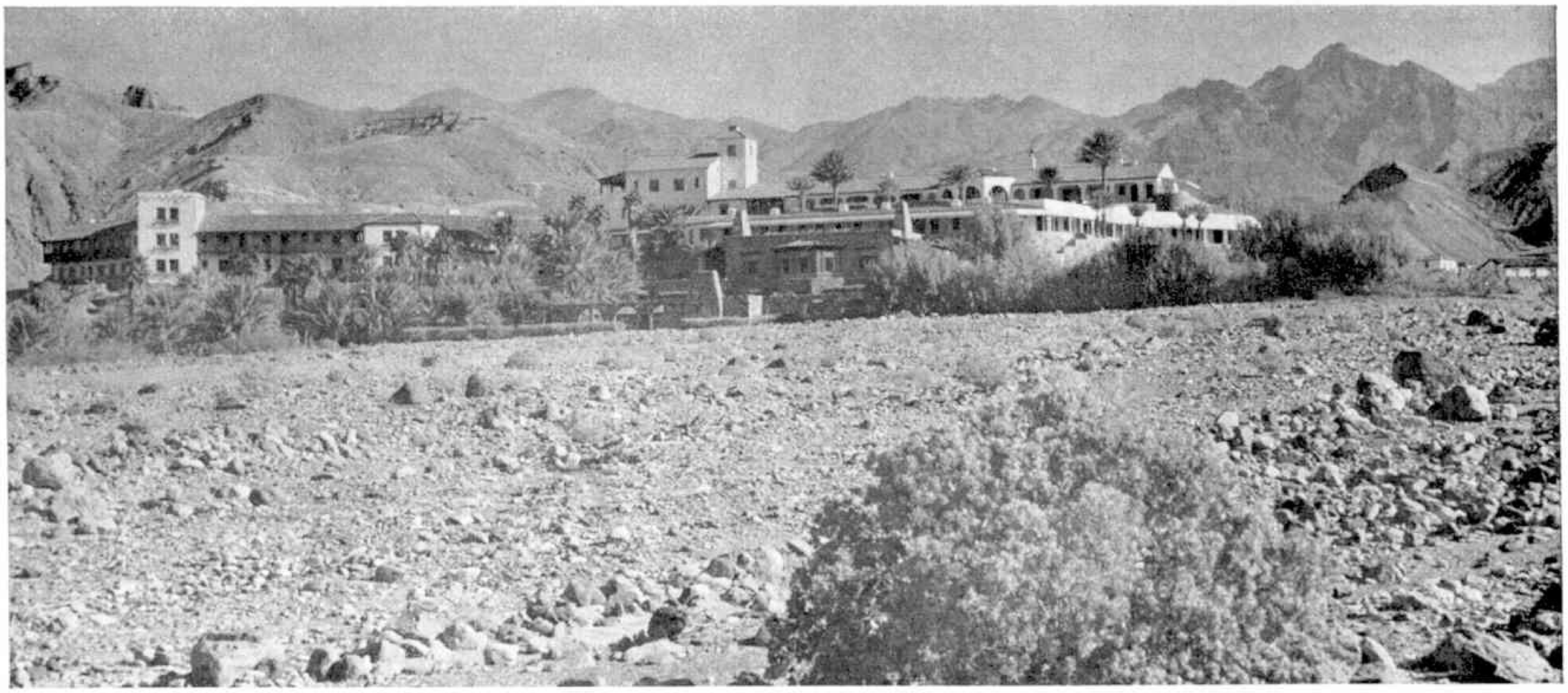
A total of 677 British firms took part in the Fair which was held in the Sokolniki Park.

Twenty-three acres of stands and pavilions displayed British goods, and more than 2,500 tons of exhibits were sent from Britain by sea, road and rail.

The Fair, which was nearly three times the size of any previous event of that nature held in the Soviet Union, was opened by Mr. Reginald Maudling, President of the Board of Trade. It was open every day, including Saturdays and Sundays, from 9 a.m. to 9 p.m.

Regimental bands specially flown by air from Britain gave daily performances on the site.

The Element Boron Shows Its Paces



Furness Creek, in the borate desert. This picture and that on the next page are by courtesy of Borax Consolidated, Ltd.

COMBINED in everyday boric acid used as eye-lotion and in ointments, and also in the common borax of the household, is the one-time insignificant element of the chemist, named boron—one which many a chemistry student regarded as true to its French name *bore*.

By
Maurice Schofield,
M.A., B.Sc.

For 4,000 years a crude borax, the ancient "tincal" of Tibet, had been carried by goats and yaks to India and the markets of the Far East. It was a commodity known as a mild alkali for cleansing and as flux for ancient metallurgy. A classical beginning it had, too, with Marco Polo added to its history for good measure, and —much later—Humphry Davy and famous French chemists preparing, from boric acid, the first samples of boron element.

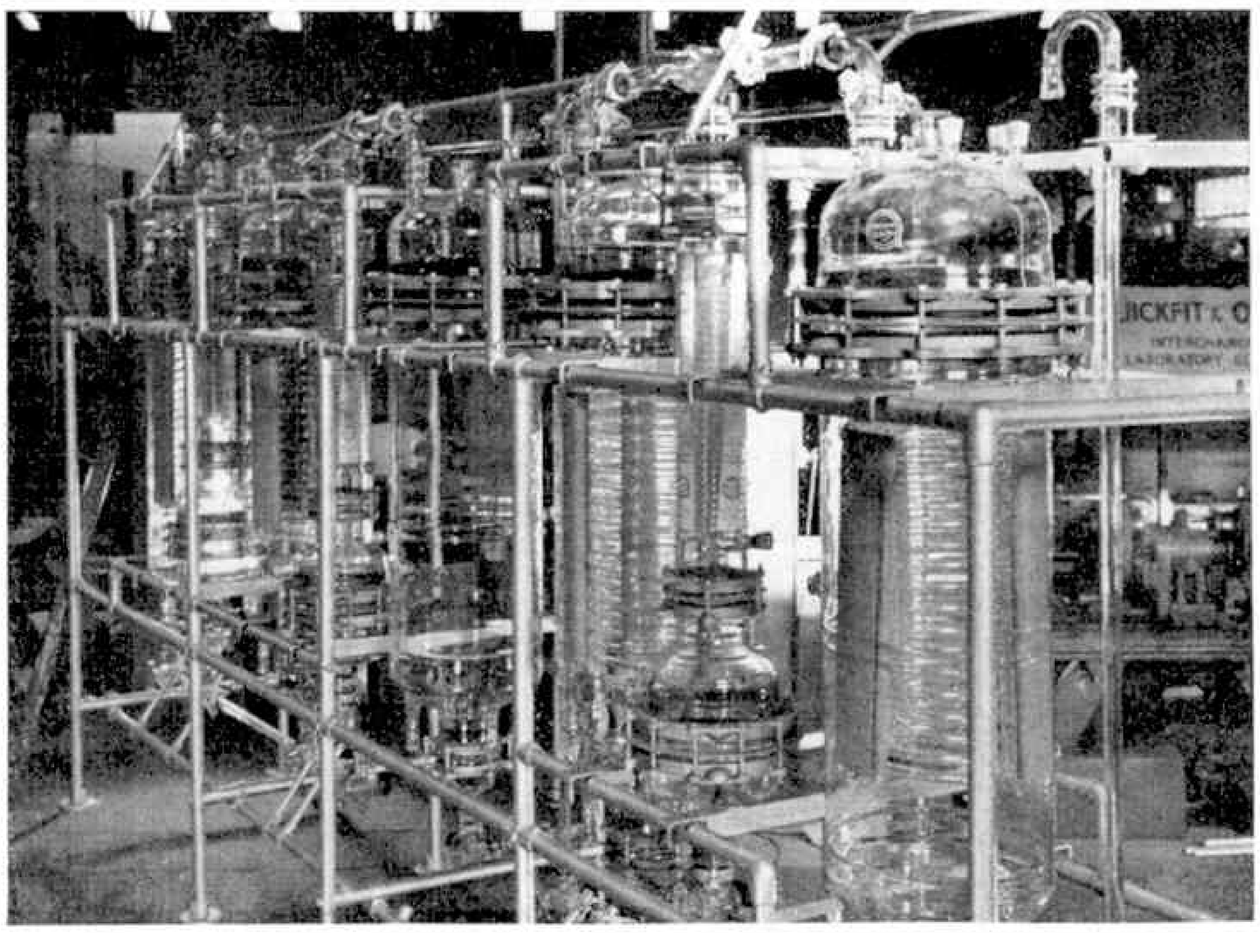
But then came a number of surprising chapters in its story, with boron literally rocketing into the headlines in a manner which caused even the hard-boiled chemical engineer to raise his eyebrows.

Boron suddenly popped up in ram-jet "H.E.F.s", or high energy fuels, costing 700 dollars a gallon. Yet, since Nature had provided millions of tons of hydrocarbons in petroleum, but no hydroborons, the rocket and ram-jet technologists called for them regardless of cost.

These hydroborons or "H.E.F.s"—sardonically called "exotic" or even "quixotic" fuels at such a price—when added to other uses for modern boron, such as alloys in blast-nozzles and gas-turbine parts, illustrate only one chapter in the strange story of boron not given in textbooks. To search the files or pages of industrial chemistry within recent years is to find a history rivalling fiction.

Turning first to sources of borates in the earth's crust, two examples in Tuscany and the Californian "alkali deserts" really capture the imagination.

The volcanic steam jets or *soffioni* of Tuscany have been known for many years, accepted as a natural phenomenon just as were the geysers or hot springs of Iceland. Then an apothecary named Höfer showed that these volcanic jets could be used to produce boric acid; this by evaporation. Artificial lagoons were set up on hillsides, and the steam jets bubbling through them



Modern boron-containing glass used for heat resisting, all-glass chemical plant. Picture by courtesy of Quickfit and Quartz, Ltd.

yielded the boric or boracic acid, this also forming borax by reacting with common soda. Yet, all this moderate use of *soffioni* became insignificant when Italian engineers not only planned to harness the steam jets for power purposes, and then extract the boric acid from the condensed steam, but even schemed to bore deep beneath the Tuscan countryside to tap greater supplies of energy.

Rapid rise in importance

Boron as boric acid, boric oxide, and borax had rapidly risen to importance in industries producing heat-resisting glasses for domestic ware, optical glass, special soaps, and pharmaceuticals such as bath-salts, lotions, and hair-waving preparations. Hence the urge to produce more boric acid, although where Tuscany is concerned the preparations seemed more "hair-raising" than "hair-waving".

At Lardarello, a company named the *Societa Boracifera di Lardarello* set engineers to fix, at risk, steel casing-heads in new steam-jets or *fumaroles* made by drilling at greater depths than hitherto. The resulting *soffioni* were christened *soffionissimi*, so powerful were the roaring jets which kept the good folk of Lardarello awake at night. The people must have well appreciated the irony in the name then given to boric acid: *Sal sedativa!*

Apart from vast resources of natural steam-power harnessed in *soffionissimi*, the volcanic gases liberated contain carbon dioxide and helium, this helium supply being one of the few sources of that inert gas in Europe.

After the *fumaroles* of Tuscany one turns to the West, to the Californian alkali desert where prospectors have searched for a century for borate supplies.

Both calcium borate and sodium borate (an equivalent salt to borax) have been found in vast supplies in California, a State which is noted for alkali minerals. The first transporting of calcium borate across 160 miles of waterless desert forms a story which might well have come straight from a Western.

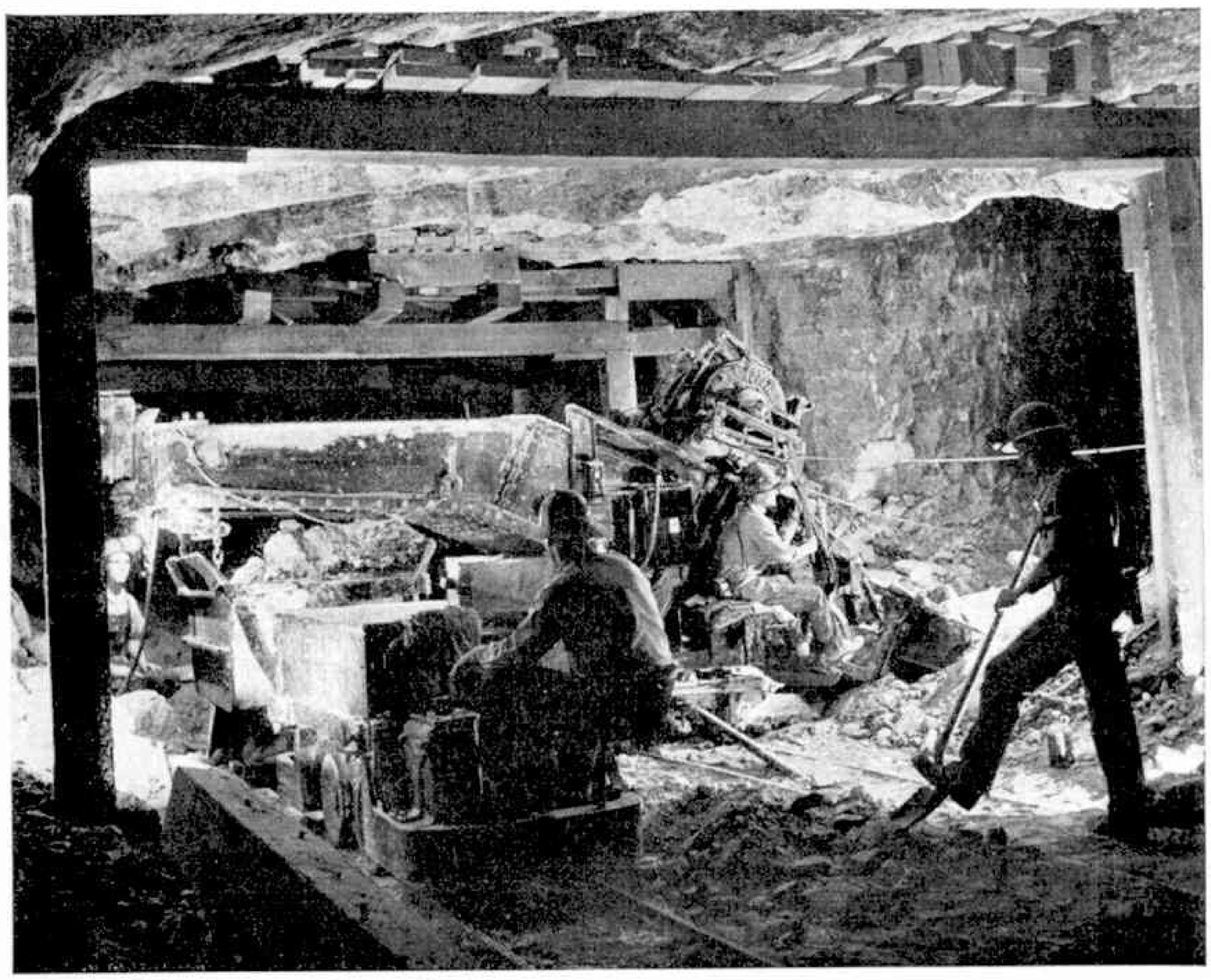
Mule driver was pioneer

The pioneer was "Borax Bill" Parkinson, a stocky man with moustache, western hat and riding kit, the driver of a famous Twenty-mule Team which gave its name to a brand of borate on the market. Each mule answered by pricking its ears when called, and ten pairs of mules hauled two 12-ton borate wagons, together with a trailer holding the 1,200 gallons of water which was so vital to Borax Bill and his "swamper"—or cook-cum-factotum—during that 160-mile drive across the desert, under a pitiless sun. Only eighteen miles a day was possible through this region with areas bearing names like Funeral Mountains, Furnace Creek and Devil's Golf Course, a spot where, even today, a photograph of Death Valley Hotel seems a set for a TV Western.

A second story of a similar type has as its chief character a Birmingham prospector who found rich "salt" deposits —this time sodium-borate—in the Californian desert. His name was Arthur Rowbottom, a pioneer who became inquisitive about the type of "salt" crystals glistening in the sand in the glaring sun.

One day, Rowbottom came across a hump or lumpy mound of a peculiar shape in Borate Valley—one which caused him to dig into it with a spade. The mound, on removal of the crust, turned out to be the carcase of a horse abandoned by an emigrant caravan dweller seven months previously (as he found on later inquiry); a carcase perfectly preserved by the encrusted borax—a fact not quoted in advertisements regarding preservative borax and boric acid!

The Birmingham prospector soon appreciated the value of the borate deposits in the region, bought the rights from the



Excavating borax at a boron mine face.

Californian State Government for £5,000 and, back in the Midlands, set up the Patent Borax Company, an organisation which, last century, anticipated modern advertising with such products as Borax Beauty Toilet Powder, Borax Electric Voice Crystals, Perfumed Borax Parisienne, Borax Sweet Home Soap and Borax Queen of Beauty Tooth Powder!

From such striking stories in the history of boron one turns to boron of today, and again the tale is far different from the placid element described in chemistry lessons . . . .

Death Valley continued to provide vast amounts of borate minerals until 1926, when an American, Clarence Rasor, discovered rich deposits of sodium borate underground in the Kern Country region of California. The mineral was named "Rasorite" in his honour, while the region of Furnace Creek saw a modern hotel and residences spring up, the town which grew there being now known as Boron.

In the new drive for boron both engineers and chemists have turned to the element itself rather than solely to boric acid and borax. When Humphry Davy and, independently, Gay Lussac (or "Not-so-Gay Lussac", as students nickname him) first liberated boron by heating its oxide or boric acid with potassium metal within a copper tube, they could never have imagined its eventual use in an atomic age or age of jets. Yet, 1,000,000 tons of borates consumed each year suggests that newer uses have developed other than in pharmaceutical products, or in the glass industry, where heat-resisting types such as Pyrex have a wide popularity. Such new uses include boron nitride as hard as diamond, boron carbide as abrasive material and for making sand-blast nozzles, boron for removing oxygen from steel and other metals, and boron alloys with tantalum, zirconium, titanium and other metals, such alloys being superior to others in jet units and rocket components.

Then on to borane or hydroboron fuels, brought into prominence when high-energy fuels from the lightest of elements were called for in jet aircraft, rocket motors and guided missiles. As for the immediate future for boron, after Borax Bill's drive for borates, Tuscany's volcanic jets, H.E.F.s for ram-jet engines and boron now entering the atomic field, one may well wonder what next?

The Hustler Grows Another Pod

NO military aeroplane in the world has a more interesting design than the Convair B–58A Hustler supersonic bomber. By hanging its four jet-engines, its warload and part of its fuel underneath in pods, Convair have been able to keep it remarkably small, with a span of only 56 ft. 10 in. Yet, it is no short-range aircraft. On March 23, 1960, a U.S.A.F. crew remained airborne in a B–58A for more than eighteen hours, during which time they covered 11,000 miles. They were, of course, refuelled in flight, and this same technique enabled a Hustler to fly non-stop 3,669 miles from New York to Paris in 3 hr. 20 min. on May 26 this year, at an average speed of 1,105 m.p.h.

Originally, the Hustler carried a single large pod under its fuselage, divided into separate compartments for fuel and warload, but this is now being replaced by two separate pods. As shown in the larger illustration on this page these consist of a small upper pod, carrying the H-bomb, and a large pod for fuel. This pod has a recess into which the smaller one fits quite snugly.

In action, the Hustler would use the fuel in the lower pod during its outward flight to the target and jettison the pod when it became empty. It would release the smaller weapon pod in a faster-than-sound dash over the target, then streak for home unencumbered by "empties".



Two-part pod. Convair crew inspects the new two-part droppable pod on an Air Force B-58 Hustler bomber. The new pod, which provides additional speed and range, is in production at the Fort Worth, Texas, plant of Convair Division of General Dynamics Corporation, by whose courtesy this picture is reproduced.

AIR NEWS

By

John W. R. Taylor

ADVENTURE IN OMAN

The R.A.F.'s Twin Pioneers are gentle, "go-anywhere" machines, but flying them is not without its moments of excitement, as Flying Officer A. J. S. James of No. 152 Squadron recently discovered.

While searching for a stretch of ground suitable for an airstrip in the desolate, rocky Shihu country in the northern hills of Oman, he decided to investigate a likely-looking spot inside a volcanic bowl measuring about two miles by three. The moment he touched down he found himself surrounded by scores of natives, some carrying ominous steel hatchets on the end of walking sticks. They proved to be remnants of the ancient race of Hittites and had never seen even a car before, much less an aircraft.

Quite clearly they did not approve of the Twin Pioneer. Their chief spat angrily at it, and one man, who spoke a little Arabic, told Flying Officer James that they believed the aircraft would stop all future rain. The pilot decided that the sooner he measured the airstrip and took off the better; so he began to pace it out. This seemed to make the tribe even more annoyed, so he decided to give up and climbed back into the Twin Pioneer, but not before the chief had struck him on the arm with the flat of his hatchet.

By this time, all the Hittites were shouting and waving their hatchets in the direction of the aircraft. However, they scattered in panic when Flying Officer James started the starboard engine and began to taxi. . . . .

Five days later, he flew over the area again. The Hittites need not have worried; the entire valley was flooded!



The U.S. Navy's twin-turbine Sikorsky HSS-2 helicopter flashes by the photo-timer while setting up a new world helicopter speed record of 192.9 miles an hour over a three-kilometre (1.86 miles) course at Windsor Locks, Conn., U.S.A. (Photo.: Sikorsky Aircraft Division of United Aircraft Corporation.)

LOW FLYING IS SAFER

The Royal Navy's Blackburn Buccaneer is one of the few aircraft in the world strong enough to fly at around the speed of sound at very low altitudes. In action, this would enable it to dash in to a target area at sea level, "under the radar", and escape before the enemy knew what had hit them. The picture on page 281 is the first to show it on this kind of mission.

As the Buccaneer will be armed mainly with nuclear weapons, it will be painted all over with glossy white anti-radiation paint when it enters squadron service on board the Navy's carriers. The Mk.1 version, now in full production, is fitted with two 7,100 lb. thrust de Havilland Gyron Junior turbojets. The later Buccaneer Mk.2 will have two of the new 10,000 lb. thrust Rolls-Royce Speys, making it even more formidable.

FLYING BEDSTEAD HONOURED

When the aeronautical collection of the Science Museum is displayed properly for the first time in its new building at South Kensington next Spring, it will include the Rolls-Royce "Flying Bedstead."

This strange contraption may look out of place beside famous aircraft such as the Vickers Vimy of Alcock and Brown, A. V. Roe's little triplane of 1909 and the pioneer Gloster-Whittle E.28/39 jet-plane, but it well deserves its place of honour. From it has been developed the highly successful Short SC.1 jet-lift vertical take-off research aeroplane, and air travel may be much safer, one day, when air-liners use the same technique to take off and land vertically, at each end of their journey.

FIVE-ENGINED JET-LINER

Boeing have fitted a fifth engine to the seven-year-old prototype 707 jet-liner. As can be seen in the bottom illustration on this page, it is mounted on the side of the rear fuselage, like the engines of the French Caravelle, and has a curled-up exhaust pipe to carry the hot gases over the tailplane.

The idea is not to help the 707 along in its old age, but to test the aerodynamics of the rear-mounted engine, which is in the same position as one of the three engines of Boeing's next jet-liner, the smaller Model 727. Special flaps have also been fitted on the wing leading and trailing edges, similar to those designed for the 727, for Boeing are anxious to check that turbulent airflow from these flaps does not affect operation of the rear-mounted engines.

The 727 will not need the uptilted exhaust pipes, as its tailplane will be mounted on the tip of its fin.

FRENCH AIR FERRY OPENS

When I flew over to France with my car recently, I was surprised to see at Lydd Airport a Bristol Superfreighter ferryplane in the insignia of a French airline—Compagnie Air Transport. The explanation is that this company has bought three Superfreighters from Silver City Airways, and the two airlines are now flying "in pool" on routes from Lydd to Le Touquet and Calais, and from Hurn (Bournemouth) to Cherbourg.

Compagnie Air Transport is owned mainly by French Railways, Air France and French Lines. Its object in entering the air ferry business is to encourage French motorists to fly their cars to Britain. At present, only one Continental motorist brings his car over here for every nine Britons who take their vehicles to Europe.

IT HAD TO COME!

In America, the congestion at many airports is now nearly as bad as the traffic problem on Britain's roads. As a result, the authorities at Chicago have adopted the tow-away system which has become painfully familiar to many London drivers in the last year or so. Any aircraft which stays at the terminal building longer than 45 minutes is liable to be towed away to a remote parking area.

FASTEST HELICOPTER

America regained the international helicopter speed record on May 17, when a twin-turbine Sikorsky HSS–2 of the U.S. Navy averaged 192.9 m.p.h. in two runs over a three-kilometre course at Windsor Locks, Connecticut. This exceeded by more than 25 m.p.h. the previous highest speed, achieved by a Russian Mi–6 helicopter in November, 1959.

One week later, the HSS–2 gained a second record, by flying around a 100-kilometre (62-mile) circuit at 174.9 m.p.h. On each occasion it was piloted by Commander Patrick L. Sullivan and Lieutenant Beverly W. Witherspoon.

The HSS–2 is an anti-submarine helicopter, powered by two 1,250 h.p. General Electric T58 shaft-turbines. It has a flying-boat hull, as well as a retractable wheel undercarriage. This is interesting, because no amphibious aircraft has ever before held a record that is open to non-amphibious types.

R.A.F. RAINMAKERS

An unusual job was done by the R.A.F. in East Africa recently, when it was called to the aid of rain-starved farmers.

The Machakos district of Central Kenya, farmed mainly by the Kamba tribe, has had poor rainfall for the past six years. What little grazing this rain produced was ravaged by game which wandered out of the nearby National Game Park in search of food.

The local Board of Agriculture asked the R.A.F. if it could help, and Flight Lieutenant J. H. Besant was sent up in a Pembroke transport to try a rainmaking experiment. He took with him a representative of the East African Department of Meteorology and three members of the R.A.S.C. whose job was to drop fine salt on clouds that looked as if they might produce rain.

Although the cloud formations found in the area were far from ideal, several clouds were "seeded" by dropping into them about one pound of salt. To everyone's delight, this produced about half an inch of heavy rain. Since then, a little rain has fallen naturally in the area—so many of the tribesmen must regard Flight Lieutenant Besant as a pretty powerful witch doctor!

Below: The Blackburn Buccaneer pictured at low altitude. Right: A close-up view of the fifth engine mounted experimentally on the Boeing 707 prototype.





THE TEA AND SUGAR SPECIAL



Hauled by a General Motors diesel-electric locomotive the Tea and Sugar Special rumbles along the Trans-Australian Railway. Photograph by courtesy of the "Adelaide Advertiser".

● *Across the baking wilderness of the Australian plains rolls one of the most interesting trains in the world—a portable town centre, complete with shops, clinic and a church. Its unusual story is told in this article.*

THE world's most unusual train—that's the *Tea and Sugar Special.* Rolling leisurely across Australia's baking Nullarbor Plain, the *Tea and Sugar* looks at first sight just like any other mixed train on the Trans-Australian Railway. There is the big General Motors diesel-electric up front, some tank cars, an open truck or two, a refrigerator car, a few vans and some coaches.

But appearances are deceptive. The *Tea and Sugar*—officially Train No. 543 "Slow Mixed" westbound from Port Augusta, S.A.—is really a whole town centre on wheels, complete with shops, clinic and church. Its journey: 1,000 miles along Australia's trans-continental line. Its customers: the hundreds of railwaymen and their families who live along the route of this remarkable railway, often the only inhabitants, for miles around, of a vast, flat, arid wilderness.

East-West Link

The Trans-Australian Railway, constructed, owned and operated by Commonwealth Railways, is a great engineering achievement. Completed in 1917, it was built to link the Eastern States of Australia with Perth, the capital of Western Australia.

The line is 1,108 miles long and connects with the respective State railway systems at Port Pirie Junction in South Australia, 134 miles from Adelaide, and Kalgoorlie in Western Australia, some 380 miles from Perth.

The "Trans", as it is affectionately known throughout Australia, is standard gauge (4 ft. 8½ in.) while the gauge of South Australian Railways is 5 ft. 3 in. and the West has a 3 ft. 6 in. gauge system, so that even today the traveller must change trains twice between Adelaide and Perth.

By

H. G. FORSYTHE

Constructing the line presented some unusual problems. Although no mountains or rivers had to be crossed—the "Trans" is unique in possessing not a single viaduct or bridge throughout its length—there was not one running stream anywhere within miles of the route. Intense heat, with temperatures as high as 130 degrees in the shade, was encountered. Water, as well as all food and construction materials, had to be hauled from far off.

Water has always been a serious problem on the railway. Some was found underground and could be pumped to the surface, but only a little of it was suitable for drinking, still less for use in locomotives. Long distances between water supplies meant that huge tenders had to be fitted to steam locomotives. The efficient C Class 4–6–0s, which for years handled traffic on the Trans-Australian Railway, had tenders of no fewer than 12,000 gallons capacity. These impressive-looking steam engines hauled the *Tea and Sugar* and the luxury *Trans-Australian Railway Express* until the diesels replaced them.

The *Trans-Australian Railway Express* has always been one of the most comfortable trains in Australia, indeed, in the world. Today its all-steel, air-conditioned coaches provide truly magnificent accommodation more like that of an hotel than a train. There are lounge cars, complete with music rooms, Roomette sleeping cars which have their own showers and iced water supply and, of course, a dining car and an observation car. There is a radio in every compartment and facilities are provided for passengers to despatch and receive telegrams while travelling.

Diesel hauled, the modern *Trans-Australian Railway Express* takes only 27 hours to cover the 1,108 miles between Port Pirie Junction and Kalgoorlie, just over half the time previously taken by steam.

Like any other major railway, the "Trans" employs a large operating and maintenance staff and the duties of many mean that they and their families must live along the line at isolated depots and stations. The welfare of these employees has always been a major concern of Commonwealth Railways, and a special

organisation is in being to care for the staff and supply all its needs.

This organisation operates a farm, and has its own bakeries, butchery, laundry and generating station. No other railway in the world can boast of being so completely self contained.

The headquarters store is at Port Augusta, 191 miles from Adelaide, and the *Tea and Sugar* provides the link between this and the families all along the line.

The *Tea and Sugar* stops first at Bookaloo, 52 miles out of Port Augusta, then travels on to Pimba for the first overnight stop, past the great flat glistening "Lakes" which are really shallow salt beds. Next day the train moves on to Kingoonya and Tarcoola, a tiny hamlet but still the biggest settlement between Port Augusta and Kalgoorlie, where day-time temperatures are usually around the 110 degrees mark. A few low, rugged hills can be seen nearby and just outside the township is the boundary fence of "Wilgena", a typical sheep station of the area covering 1,920,000 acres of saltbush country.

On and on further west rumbles the *Tea and Sugar*, past red sandhills, with the countryside becoming hotter, drier and more desolate. Then it reaches the edge of that great limestone plain which stretches onwards for 450 miles without a tree or a hill or any other landmark as far as the eye can see—the fantastic Nullarbor Plain.

At every settlement and camp along the line the scene is the same. As the *Tea and Sugar* smoothly draws to a halt amid a little group of houses clustering around the line, out come the railwaymen, their wives and children.

The provision car opens up for business and fresh meat from the refrigerator car appears on the butcher's chopping block.

In the Welfare Car, the doctor prepares for surgery, while one of the waiting rooms becomes a temporary chapel as the travelling clergyman conducts a service. In another car, railwaymen queue for their pay packets.

Further down the train water is being pumped into storage tanks at the lineside, and firewood unloaded. Outside their "shops" housewives stand chatting just as they would in any other town centre.

Soon it is time to move on and the *Tea and Sugar* rolls on deeper into the shimmering heat of the Nullarbor. Now the train is on the longest straight stretch of railway track in the world. Three hundred and twenty-eight miles without the slightest curve—almost as far as the distance from London to Edinburgh.

At night, the *Tea and Sugar* stands in a siding while its crew sleep at one of the comfortable rest houses Commonwealth Railways provide for train crews all along the route.

At Cook, once an important steam locomotive depot, 512 miles and three days out from Port Augusta, the *Tea and Sugar* does brisk business. Over the border and into Western Australia the Nullarbor still stretches vast and flat into the distance, like the unfamiliar landscape of some other planet. On a passing road, the *Tea and Sugar* waits while the *Trans-Australian Railway Express* thunders past.



The train is in, and housewives can chat outside their local "store", the shop on wheels which brings them their supplies.

On the desolate Nullarbor Plain a railway engineer carries out a survey as the Trans-Australian Railway Express goes by. This picture and the one above are by courtesy of Commonwealth Railways.



Still further west the train proceeds, and at last the edge of the desert appears. Away in the distance a dark line of trees shows up sharply etched on the horizon —the first timber for 1,000 miles.

Another 200 miles and the *Tea and Sugar* finishes its trek at Kalgoorlie, surely a most unusual journey by a most unusual train.

PRIZE IS VISIT TO ITALIAN GRAND PRIX

Two famous names—those of Revell and Dunlop—have teamed up to introduce a most attractive contest to be held this month. Details will be found in our advertising pages.

A free trip by air to the Italian Grand Prix at Monza, on September 10, with all expenses paid, will go to the winner of the contest, his father and his Revell Dealer, plus the opportunity to meet the winner of the race in the Dunlop racing pit.

The competition itself is not difficult. Contestants are asked to write in not more than 50 words why the Cadet Consul (or any other car in the Revell Cadet Series) is their favourite kit, and to send this with two Cadet car names cut from two box tops, to Revell at Maidstone House, 25/27 Berners Street, London, W.1., before August 21, on the special entry form supplied. These are obtainable from toy, model and hobby shops and cycle stores displaying the competition window banner. Arrangements have been made to ensure that the winner is made completely at home from the moment he, his father and the Revell Dealer accompanying them set foot on Italian soil. During their stay in Italy, they will be the guests of the Dunlop Rubber Co. Ltd.

DINKY TOYS NEWS

By "THE TOYMAN"

U.S. And Continent Set The Style For Latest Models



ELEGANCE OF THE EL CAMINO

FROM the letters that reach my desk day by day, week by week throughout the year, it is obvious that while many collectors like to see as many British cars as they can in the Dinky Toys list, they are also very glad to welcome models based on outstanding cars which are popular in America and on the Continent.

I am, therefore, quite sure that all collectors will be delighted with the two latest Dinky Toys models, for they have an international flavour about them which will widen the scope of activities on layouts large and small.

The first of the two models just released is illustrated at the top of this page and in the dock-side view at the foot of the next page. It is the Chevrolet El Camino Pick-up Truck and it is, as you can see, an extremely eye-catching and graceful model.

Its name is not solely picturesque, as one might imagine, for El Camino is Spanish for "the route" or "the road", and so this smart vehicle is, in fact, appropriately named. No. 449 in the Dinky Toys list, it is equipped with "finger-tip steering", windows, seats, steering wheel and four-wheel suspension and, as befits a car of American stock, it is, of course, provided with a left-hand drive.

The Dinky Toys model has a most attractive two-tone colour scheme of off-white and turquoise, and the attractive, open luggage platform which forms the rear portion of the car is neatly gridded. Measuring 4⅜ in. in length, and scaled at ¼ inch to one foot, the Dinky Toys model is approximately 1¾ in. wide, with an overall height of just over an inch, giving it an extremely sleek and elegant appearance.

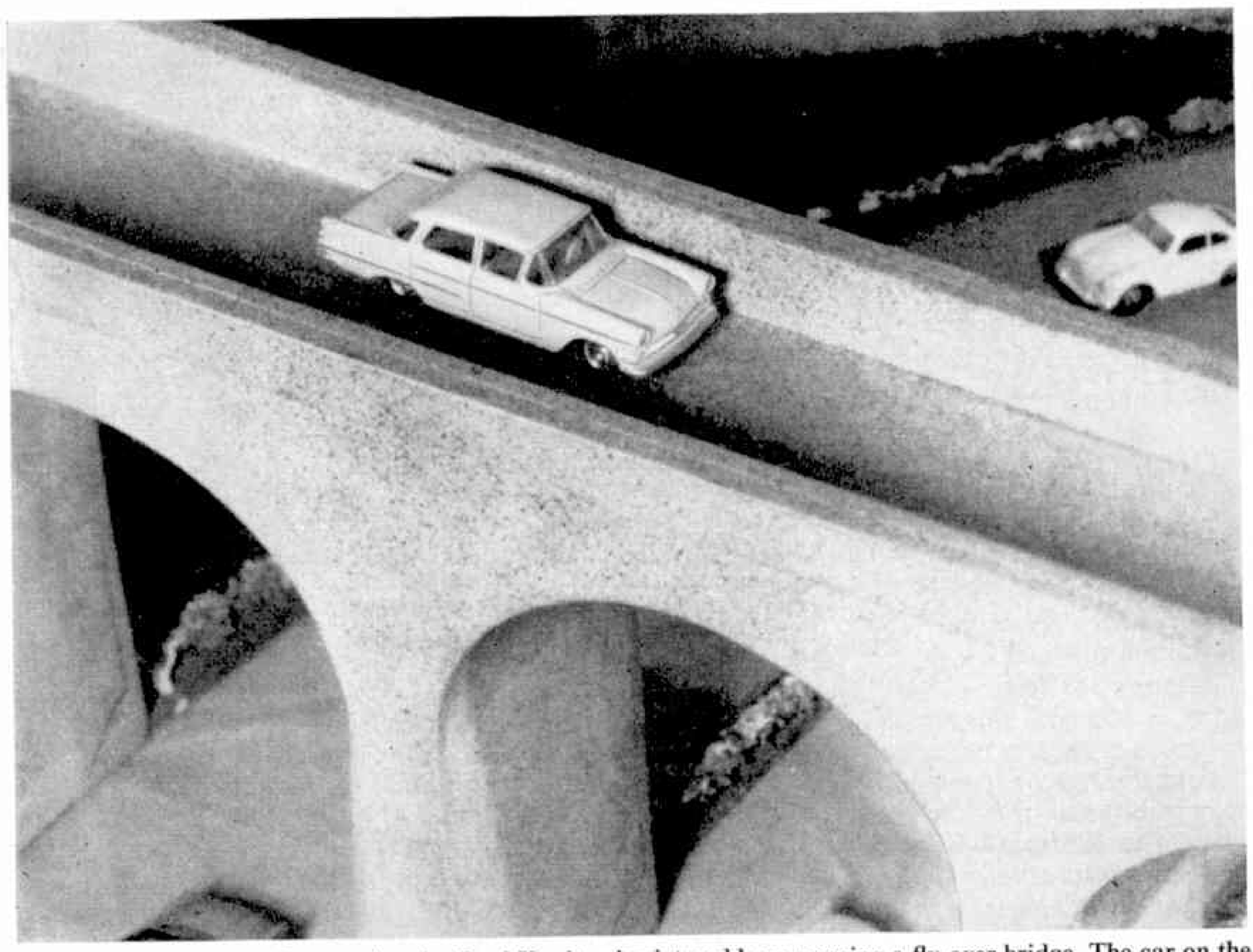
The actual vehicle is manufactured in the United States by the Chevrolet Motor Division of General Motors Corporation, in Detroit, Michigan, and its uses are many. For instance, light engineering firms use it for hauling implements and tackle; it passes excellently as a passenger car ideal for picnics, and tradesmen and farmers can use it for conveying their goods up and down the country. An enormous variety of goods or luggage can, in fact, be stowed in its big capacity pick-up box and, in a phrase, it is a commercial



The sleek lines of the new Dinky Toys Chevrolet El Camino Pick-up Truck are clearly illustrated in the picture above. Right: A close-up view of Dinky Toys No. 177 Opel Kapitan.



Among recent winners of Dinky Toys £2 awards was Ronald Slow of Canvey Island, Essex, pictured here.



In an appropriately modern setting the Opel Kapitan is pictured here crossing a fly-over bridge. The car on the lower thoroughfare in the background is the Porsche 356A Coupé (Dinky Toys No. 182).

vehicle of ability and beauty which can at the same time be a pleasant family car.

It is 17 feet 6¾ inches long by 6 feet 8¾ inches wide, with an overall height of 4 feet 10⅜ inches. It has a wheelbase of 9 feet 11 inches, with a front track of 5 feet 0¼ inch and a rear track of 4 feet 11¼ inches.

The pick-up box itself is over 6 ft. long and just over 5 ft. 4 in. in width and the vehicle's motive power is supplied either by a 135 h.p. Hi-Thrift 6 (series 11) engine or a 170 h.p. Turbo-Fired V8 (series 12) engine. The fuel tank has a capacity of 17 gallons and the gear-box is three-speed, synchromesh. The suspension is supplied by coil springs both at front and rear. Passenger comfort is ensured by a foam-rubber bench seat in the driving cab and so, all in all, the vehicle combines comfort with efficiency and usefulness.

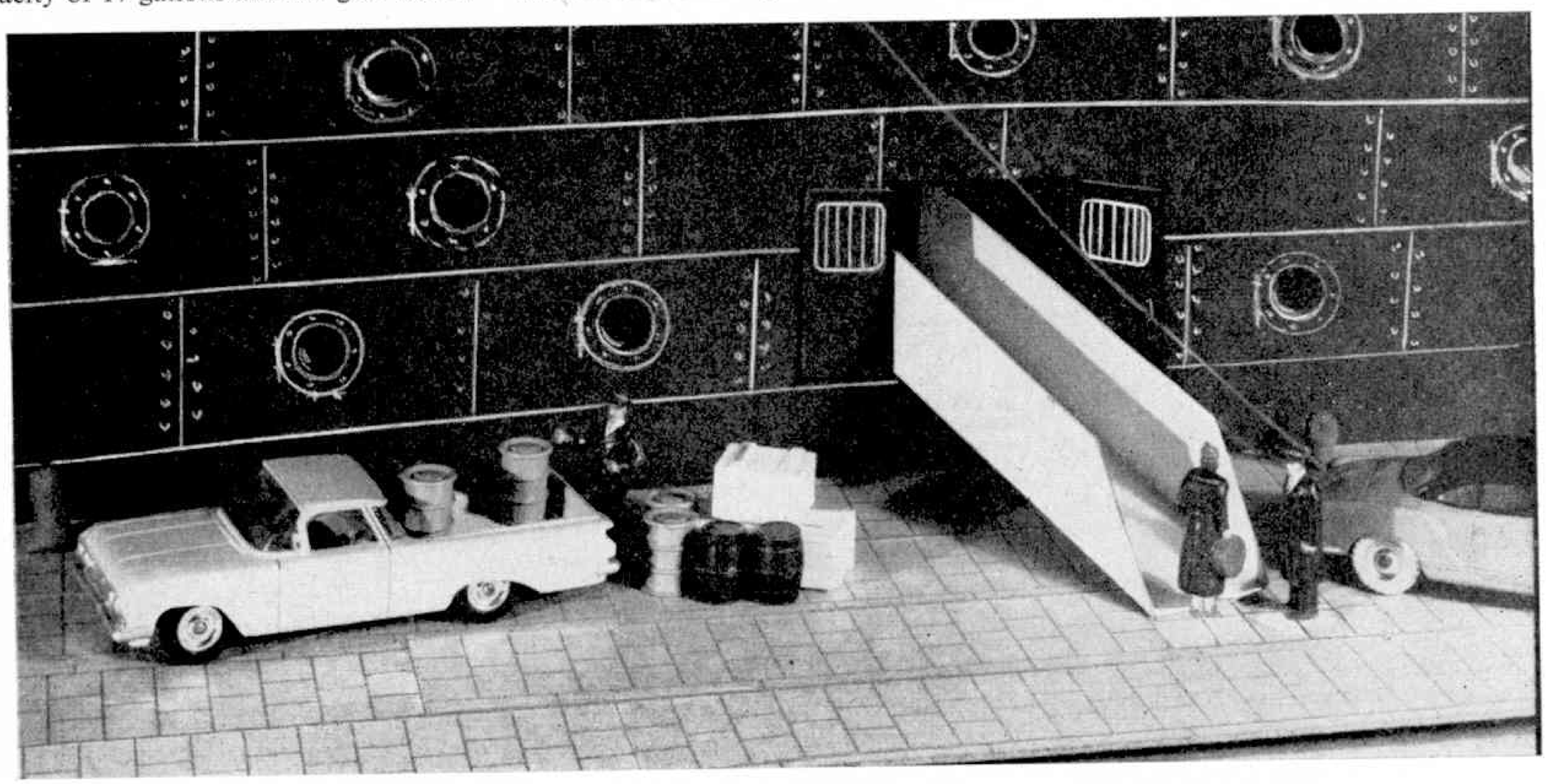
Now let us turn to the second model just released, which comes from the Continent. This time we have a saloon car finished most attractively in pale blue —the Opel Kapitan, which is No. 177 on the Dinky Toys list. This is another miniature which will be highly popular with collectors and you see it illustrated in close-up on page 284. It is based on a model manufactured by the Adam Opel Company of Russelsheim, Germany, and is distributed by the General Motors Export Organisation. Brief details of the actual vehicle are: Overall length, 15 ft. 10 in., width, 5 ft. 11 in., height, 5 ft., wheelbase, 9 ft. 2 in. The engine is a six-cylinder model of 2,500 c.c. and the gear-box has three forward speeds and one reverse, synchromesh. Maximum speed for this fine vehicle is round about 95 miles per hour.

Interior comfort is a feature of the Opel Kapitan. It has a well-upholstered rear bench seat and, for touring purposes, the backs of the separate front seats can fold backwards at the touch of a handle and fit snugly in position against the rear seats to form a full-size double bed. The car may, alternatively, be obtained with a bench type front seat. There is no possibility of the collapsible backs of the seat suddenly folding while the car is in motion. The mechanism is specifically designed to prevent any possibility of this taking place.

So far as the Dinky Toys model of this vehicle is concerned, it is, like the American model previously discussed, fitted with a left-hand drive. It is 3 15/16 in. in length, with an approximate width of 1⅜ in. and a height of 1 3/16 in. As is the case with all recent Dinky Toys models it is equipped with "finger-tip steering", four-wheel suspension, windows and seats. The last-named are in bright red, contrasting favourably with the exterior colour of the vehicle.

Now, I would like you to have a look at the picture at the top of this page, which shows the Opel Kapitan in a rather interesting scene. It is an "aerial shot" of

The liner has pulled into the quayside and goods are being loaded into the wide pick-up box of the Chevrolet El Camino Truck.





Dinky Toys Club member R. McGillivrey, of Brockley, London, is seen here in a summer setting with some of his miniature vehicles.

the vehicle travelling along one of the modern fly-over bridges, but, as you will see, it is a Continental scene with a roadway down below similar to the German autobahn. As most readers know, the autobahnen are high-speed motorways and we in England now have something similar in the shape of the M1 and other similar thoroughfares.

Adding to the realism

Finally, we return to the El Camino, which is featured in the picture at the foot of page 285. Here you see the vehicle near the gangway of an ocean-going vessel collecting crates and barrels which have been unloaded there. These barrels and other items, which greatly add to the realism of a scene of this nature, are available at Dinky Toys dealers in this country, but they are made at the Meccano Factory at Bobigny, near Paris.

DINKY RHYMES

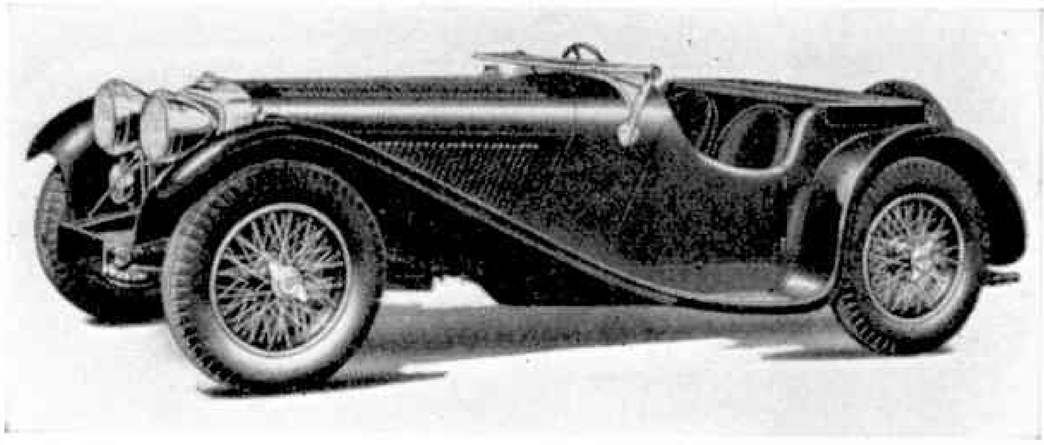
No. 966—Marrel Multi-Bucket Unit



On building sites it's just the thing,
From Norwich to Nantucket,
For loads are handled with a swing
By Marrel Multi-Bucket.

THEY WERE DIFFERENT THEN

No. 6: The Jaguar



First sports two-seater to have the name Jaguar, the 2½ litre S.S. Jaguar 100 competition model. It was announced in 1935 and sold at £395. This picture and that which appears below are by courtesy of "The Autocar".

By PATRIC BAKER

LIKE many other fine cars, the lithe and speedy Jaguar is of humble birth. Its story began in 1923 when the Swallow Coachbuilding Company started making motor-cycle side-cars in a small Blackpool workshop. The business soon prospered and it was not long before a range of special Swallow bodywork was produced for the Austin Seven and, later, the Wolseley Hornet.

This venture into the car world proved so successful that the firm moved to larger premises in Coventry—the present home of Jaguar Cars Limited—where, in 1931, the first S.S. model was built. It had a modified Standard 16 h.p. chassis on which was mounted sports coupé coachwork of rakish and advanced design. This was the S.S.1—a car to remember since it set the standard (no pun intended) of performance, beauty and low price which has become the Jaguar hallmark.

In 1937, the Swallow Coachbuilding Company was changed into S.S. Cars Limited. This marked another important stage in the development of the breed; the cars were now wholly made in the Coventry plant under the name S.S. Jaguar. At this time, the range consisted of a 1½ litre four-cylinder model and 2½ litre and 3½ litre models, both with overhead-valve six-cylinder engines. A special sports version, called the S.S. 100, and capable of 95-100 m.p.h., was also offered.

After the last war, the prefix "S.S." was dropped altogether and a series of exciting new models appeared. Most memorable of these was the famous XK 120, announced at the end of 1948, and hailed, soon after its appearance, as the fastest production vehicle in the world. In the last decade the model has been modified through such variants as the XK 140 and 150, and the racing C and D type Jaguars, which have gained laurels in almost every branch of motor sport. Most recent addition to this side of the Jaguar family is the new E type model, powered by a 265 b.h.p., 3.8 litre engine developed from racing experience. This gives speeds of over 150 m.p.h. in road trim.

The post-war Jaguar range has also produced such fine cars as the Mark VII, which use the XK 120 engine, and the current Mark IX, powered by the 3.8 litre unit, and available with such refinements as automatic transmission and disc-brakes. But in the early 1950's there was no intermediate model to satisfy those enthusiasts who wanted a compact saloon mid-way

(Continued on page 306)

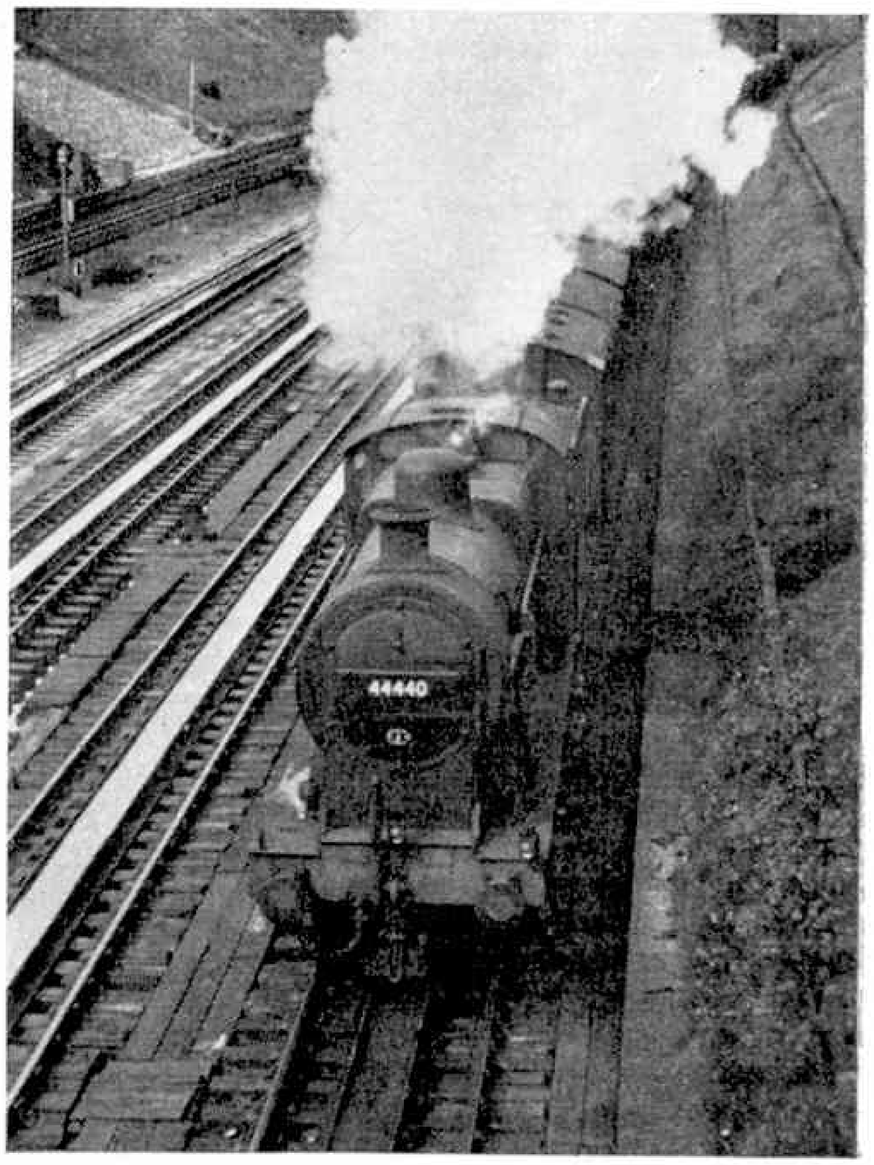


The 3.4 Jaguar Saloon. Its performance in production touring car races has been remarkable.

PHOTOGRAPHERS' PAGE

The Art Of Taking

Railway Pictures



A bridge over the line makes a viewpoint for pictures of moving trains. This slow goods was photographed effectively with a slow shutter speed.

I LOVE taking pictures of trains, so I am especially pleased to be talking about Railway Photography this month. It is often said that train photography is very difficult; that you need all sorts of special equipment. Don't you believe it! It is possible to take good pictures of trains with any camera, from the simplest to the most expensive.

The principal thing to bear in mind is what your camera can do and, as we saw last month, keep within its scope. You will remember that slow shutter speeds cannot "stop" fast-moving objects. Simple cameras, therefore, are not able to give a sharp picture of an express train passing nearby at 70 miles an hour. On the other hand, they are perfectly capable of taking excellent pictures of locomotives in stations or of trains starting off or moving slowly, belching out smoke and steam. Such pictures are, indeed, often far more effective than a speeding express "frozen" by a fast shutter speed and looking just as if it had stopped dead on the main line.

Stations offer excellent opportunities for locomotive pictures. Engines waiting at the head of their trains at the open end of a big city terminus, or trains standing in smaller stations, make good objects. Take care to choose a suitable viewpoint. For instance, an opposite platform may be better than that at which the train is standing. Do remember, however, to keep well back from platform edges.

At stations, background is important and can make or mar your picture. Watch that an ugly pole or lamp post is not immediately behind the engine because, in your picture, the pole can easily look as if it is growing out of the chimney. A slight change of viewpoint is often all that is needed to cure this kind of fault. Watch the foreground, too; parcels and porters' trolleys can spoil pictures of locomotives unless you want them to add "atmosphere."

By H. G. Forsythe

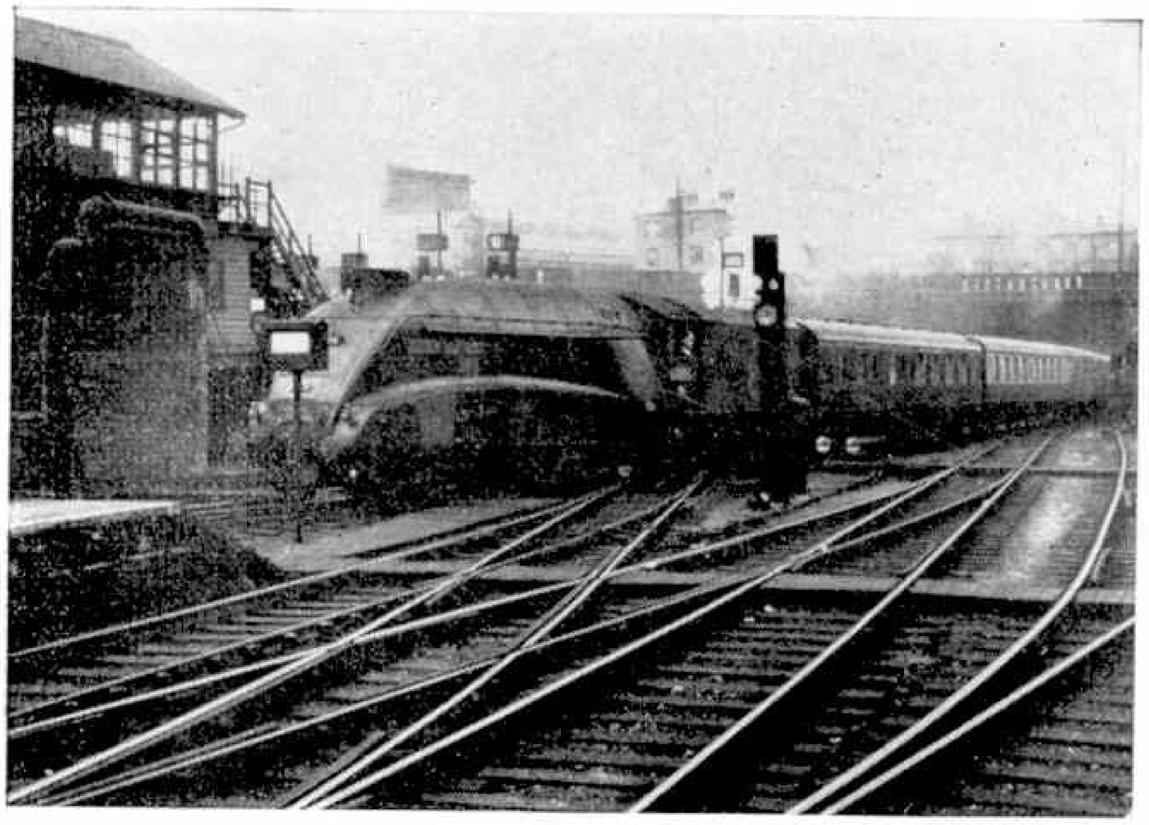
Always look out for obstructions between camera and subject. This is especially important when photographing trains moving into or out of the station. It is a good idea to choose in advance the actual point at which you want to take the picture. Be ready, with your camera held firmly, and when the train reaches the chosen point, shoot. This technique can also be used to advantage in lineside photography.

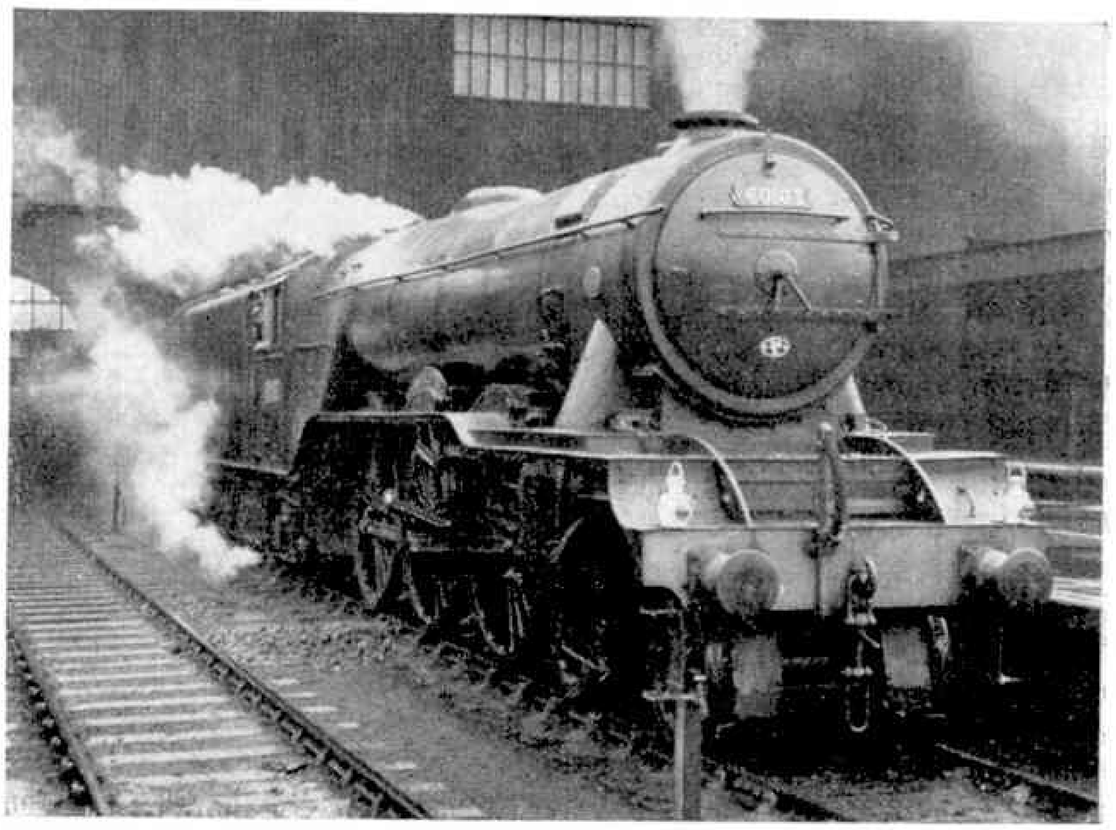
The threequarter front view of a locomotive, such as the picture of No. 60103 on this page, is a very popular one. But remember there are other ways of looking at engines, and sometimes closer views of parts of the engine, or of the crew making last-minute checks and putting up the headlamp code or train name boards, can make interesting and unusual pictures.

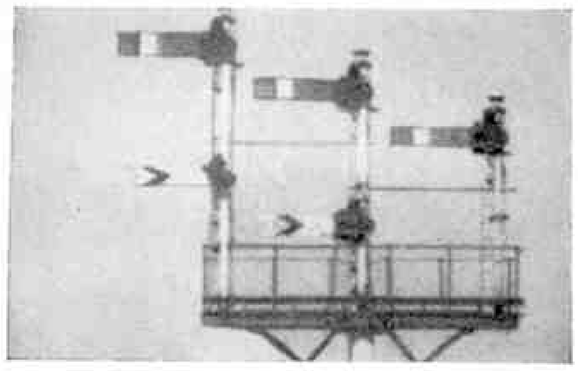
For the best possible results you need plenty of light on your subject. Steam locomotives are a little tricky where lighting is concerned because they reflect a lot of light from the top of the boiler, while the wheels and other parts are often dirty or dark. A bright, slightly overcast day is actually better than brilliant sunshine because no deep shadows are cast.

(*Continued on page 306*)

Left: The "Flying Scotsman" arrived at King's Cross but the photographer was in the wrong place. He was too far away and when he pressed the shutter the engine was partially obscured. Right: Here is a successful picture of the locomotive "Flying Scotsman" (Pacific No. 60103) caught as it was about to leave King's Cross with an East Coast express. The opposite platform provided the viewpoint.







RAILWAY NOTES

Contributed by R. A. H. Weight

SUMMER EXPRESSES HAVE FASTER TIMINGS

BRITISH Railways summer services, begun in June, build up to their peak for August, particularly as regards numerous week-end holiday, cross-country and additional long-distance or seaside trains. At this period some routes carry two or three times their normal number of passenger services. Although the summer services are generally much as last year, there are some interesting changes. Extra time allowances to cover delays due to electrification or other modernisation works during the past winter have been withdrawn on the Great Northern Line, allowing the fast timings to be restored for the *Master Cutler*, *Talisman*, *Tees-Tyne Pullman*, etc.

The northbound *Aberdonian* and the through King's Cross–Grimsby line trains are much quicker. The world-record non-stop run between Edinburgh and London in just over six and a half hours each way by the steam-hauled *Elizabethan* is on again for the season.

Among accelerated expresses to and from Euston, the *Caledonian* and *Royal Scot* are now allowed seven hours northbound to Glasgow, or five minutes longer in the opposite direction, with one stop. The *Comet*, and *Mancunian*, from Manchester, the *Merseyside Express*, *Manxman*, and *Red Rose*, from Liverpool, are all due at Euston fifteen minutes earlier than they were. There are still extra slowings in force on the L.M.R. Western Division main line.

A fast service is again provided on the former Midland Railway trunk routes between St. Pancras–Leicester–Nottingham, etc., or beyond, with Peak class locomotives in considerable use among various diesel-electric types increasingly employed on the different main lines.

In the Highlands a vastly improved service applies on the farthest north, winding, single-track, 161-mile Inverness–Wick section, where there has never been need for many trains. Extra Aberdeen–Inverness diesel expresses run each way on the fastest 2½-hour schedule, calling at principal stations.

REGULAR-INTERVAL SERVICES

It is a great convenience, as well as an incentive, to travel by rail when trains on direct and connecting routes run at the same number of minutes past each hour, and to similar timings and frequencies throughout the day, as far as traffic conditions, peak periods and the like allow. In other words, they provide a regular-interval service, a phrase much in evidence lately in railway operating parlance and publicity. Most of the vast network of S.R. electric and diesel-electric services, and the multiple-unit electric or diesel services in use on an ever-growing scale in many parts of Britain, as well as some locomotive-hauled services on various lines, are already scheduled in this manner. The interval varies according to location and demand from, say, every ten minutes to half-hourly, hourly and so on.

For example, for a long while expresses have left Paddington at intervals of ten minutes or 55 minutes past the hour respectively for Birmingham and the north, or South Wales. Similarly, departure on the hour from Cardiff and also from Birmingham (Snow Hill) for London has been the rule.

The Western Region now announces a general extension of this system, commencing with fast services to and from London with associated connections, partly worked by diesel-hydraulic locomotives, to be incorporated in a new timetable from mid-September and intended to remain basically standard.

It is claimed that the new service will provide improved punctuality, more efficient operation, and make best use of engines, carriages and man-power, as well as meeting changed travel requirements. Some time-honoured schedules and long non-stop runs will disappear. A few overall journeys will take longer, but others will be quicker from point to point, providing an improved and faster service between London and intermediate places of importance such as Chippenham, Bath and Taunton.

There will be expresses on the Paddington–Bath–Bristol route every hour, starting



A Yarmouth–Liverpool Street train, hauled by Britannia 4–6–2 No. 70037 "Hereward the Wake", photographed near Shenfield by R. F. Roberts.



Here the camera of M. Edwards has caught type 1 Bo–Bo diesel-electric No. D8039 having a summer day out with an excursion from Tring to Southend. The normal work of these engines is on freight trains.



W.R. 4–6–0 No. 5909 "Newton Hall" approaches Cardiff on "The Swansea and District Holiday Express", one of the peak summer daily excursion services from towns to various resorts and places of interest. Photograph by A. F. Smith.

at 7.45 a.m. westbound; 7.15 a.m. eastbound, including the *Bristol Pullmans* and the *Bristolian* at altered times. There will be expresses at least every two hours on the routes connecting London, Taunton, Exeter, Torquay, Plymouth and beyond. A new diesel de-luxe *South Wales Pullman* will make very fast morning journeys up from Cardiff–Newport to Paddington, returning similarly in the early evening and going on to Swansea.

FAST G.E. LINE "BRITANNIA" RUNS

The Essex Coast Express, a morning business service with buffet car from Clacton-on-Sea to Liverpool Street, introduced some two years ago, provided the quickest-ever timings on its return trip from London to Clacton and also to its first stop at Colchester, covering the distances in less than one and a half hours, and less than one hour, respectively. I found the 5.27 return service one evening to be a well-filled eight-coach maroon train weighing about 295 tons gross, headed by Pacific No. 70038, *Robin Hood*.

At a peak time, amid numerous electric and other train movements, we got a late start at 5.30. Every signal was clear from that point onwards but there were extra slowings for track work, preparations for electrification or improvements in progress that provided an incentive for fine performance.

After the first of these slacks, speed rose almost to 60 m.p.h. on rising grades through outer suburbs, falling to 43 up the steepest part of Brentwood Bank. We touched 79 before easing through Chelmsford and then slowing down for repair work, but soon worked up to 66/62/69 m.p.h. over ups-and-downs comprising much of the route, before experiencing a more severe restriction at Witham, where speed might have been at its highest. After approaching at 72 m.p.h. we pulled up in Colchester Station, 51¾ miles within 57 minutes.

Crossing to the Clacton branch, noting the fly-under junction under construction, we made smart running along tracks also used by high-voltage local electric trains pending main line extension of the system, reaching Thorpe-le-Soken (where the Frinton and Walton-on-the-Naze connection awaited) by 6.46 and Clacton by 6.55 p.m. We had covered almost 70 miles overall within 85 minutes, thus improving on schedule and recovering the late start, including three extra slowings and, of course, the two stops.

No. 70011, *Hotspur*, had a rather heavier "9-on" formation on the evening southbound *Norfolkman*, one of the four best Norwich–Liverpool Street expresses, calling only at Ipswich, where I joined. There were severe slowings at Colchester and for drainage work before Chelmsford, followed by further slowings approaching adverse signals in the suburban area. In between there were downhill maxima of 80/72/78/70 m.p.h., with uphill minima at several points around 60. Liverpool Street was reached at 7.51 p.m., well within the present allowance which provides a margin for delays, amounting that day to some eight minutes.

I enjoyed an excellent dinner on the way up, being well accustomed to wielding knife, fork, spoon, stop-watch, notebook, pencil and so on, almost simultaneously!

LOCOMOTIVE NEWS

Additions to the stock of named Warship class B-B diesel-hydraulic W.R. locomotives have been announced as follows: Nos. D845–9, respectively *Sprightly*, *Steadfast*, *Strongbow*, *Sultan*, *Superb;* Nos. D867–8: *Zenith*, *Zephyr*.

Type 4 1Co:Co1 L.M.R. diesel-electric main line locomotives in service have been named after liners, as follows: Nos. D214, *Antonia*, D223, *Lancastria*, D230, *Scythia*, D232, *Empress of Canada*.

No. D7000 is the first of 95 type 3 W.R. 1,700 h.p. diesel-hydraulic locomotives of new design for intermediate main line service to and from the West of England, the Bristol and South Wales areas. This type, constructed in association with other firms at the Gorton (Manchester) Works of Beyer-Peacock and Co. Ltd., has a maximum speed of 90 m.p.h. The external appearance in blending shades of green is attractive according to the entirely different standards to which we are becoming accustomed. A Bristol Siddeley-Maybach pressurised and intercooled diesel engine is fitted; the hydraulic transmission is of the Stone-Maybach-Mekydro K.184.U type.

The bigger 3,300 h.p. type 5 diesel-electric express engines numbered in the D9000 series still under construction, and entering East Coast service, are improved in painting and exterior finish compared with the experimental "Deltic".

The D6700 series of 1,750 horsepower type 3 locomotives, having the Co–Co wheel and traction arrangement, are in the main a smaller version of the English Electric type 4 D200 class. They are intended to be allocated to E. and N.E. Regions.

SWING WATER CART: MOBILE CANTEEN

Two New Models For The Smaller Outfits

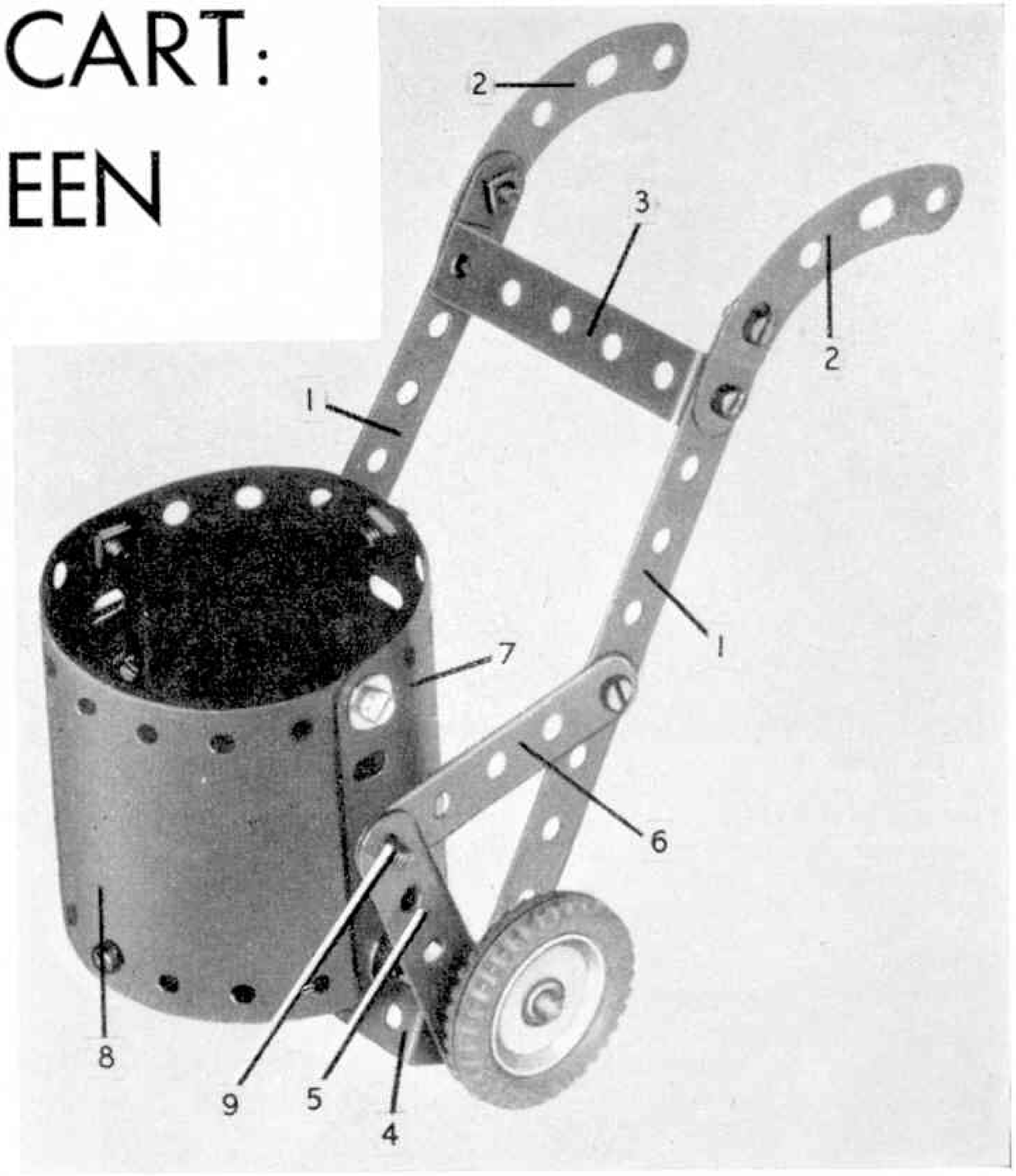


Fig. 1. A Swing Water Cart that can be made from very few parts.

THE framework of the simple Swinging Water Cart shown in Fig. 1 is built from two $5\frac{1}{2}$" Strips 1, which are extended at one end by $2\frac{1}{2}$" Curved Stepped Strips 2 to form handles. These Curved Strips are joined at the top by a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 3. A second $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 4 is lock-nutted on $\frac{3}{8}$" Bolts at the lower ends of the Strips, and at the same time a $2\frac{1}{2}$" Strip 5 is bolted in place. Next, a $2\frac{1}{2}$" Strip 6 is bolted to the Strip 1, and its other end hole is arranged in line with the end hole of the Strip 5. The wheels, which are 1" Pulleys fitted with Tyres, are fixed on a Rod passed through holes in the Strips 1.

The water bucket consists of two $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plates 7 and a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 8. These are first of all bolted together end-to-end, and then this compound plate is bent to form a cylinder and the free ends joined together. The bottom of the bucket consists of two $2\frac{1}{2}$" Semi-Circular Plates bolted together and fixed in place by Angle Brackets. Two $\frac{3}{8}$" Bolts 9 are then fixed in the bucket by nuts, and the shanks of the bolts rest in the end holes of the Strips 5 and 6.

Parts required to build the model Swing Water Cart: 2 of No. 2; 4 of No. 5; 4 of No. 12; 1 of No. 15b; 2 of No. 22; 25 of No. 37a; 18 of No. 37b; 7 of No. 38; 2 of No. 48a; 2 of No. 90a; 4 of No. 111c; 2 of No. 142c; 2 of No. 190; 1 of No. 191; 2 of No. 214.

MOBILE CANTEEN

Outfit No. 4 contains all the parts needed to build this attractive model. The chassis consists of two $12\frac{1}{2}$" Strips 1 connected at the rear by a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 2. A reversed Angle Bracket 3 is bolted to the front of each Strip and to these is attached a $5\frac{1}{2}$" Strip that forms the front bumper. The right-hand side of the vehicle is made up of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ and a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, edged at the rear by

BY SPANNER

a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 24 and a $2\frac{1}{2}$" Strip, and at the front by the rear door-jamb, which is a $5\frac{1}{2}$" Strip. The left-hand side of the body consists of a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate 4, edged at the rear by two $2\frac{1}{2}$" Strips 5 and at the front by the rear door-jamb 6. The resulting space forms the serving hatch.

The Serving-Counter

The serving-counter is made up from two $5\frac{1}{2}$" Strips 7 bolted to Fishplates 8, which are joined to the side by Angle Brackets 9. The counter is sheltered by a $5\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate joined by means of Obtuse Angle Brackets, to the roof, which is a $5\frac{1}{2}" \times 2\frac{1}{2}"$ Flanged Plate bolted through the top holes of Strips 5 and 6 and Double Angle Strip 24 on each side.

The door-frames consist of three $2\frac{1}{2}$" Strips, one $3\frac{1}{2}$" Strip and the $5\frac{1}{2}$" Strip 6 as shown. The doors themselves are made up from one $2\frac{1}{2}" \times 2\frac{1}{2}"$ and one $2\frac{1}{2}" \times 1\frac{1}{2}"$ Flexible Plate, 10 and 11 respectively. The cab roof is a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate bolted to the Flanged Plate and the $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 12 that forms the top edge of the windscreen. The bottom edge of the windscreen is also a $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strip 13. The back of the van consists of a $2\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate bolted to the $2\frac{1}{2}" \times \frac{1}{2}"$ Double Angle Strips 2 and 23. The back of the cab is a $4\frac{1}{2}" \times 2\frac{1}{2}"$ Flexible Plate bolted to the front end flange of the Flanged Plate in the roof.

The Bonnet

The bonnet is made up of two $2\frac{1}{2}'' \times 1\frac{1}{2}''$ Triangular Flexible Plates 14, a $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 15 and two Curved Stepped Strips 16. The $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate is attached to the chassis by Angle Brackets 17, the same bolts holding the Stepped Strips 16 and two further Angle Brackets 18 in place. The bonnet is strengthened by another $2\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 19.

The mudguards consist of two Formed Slotted Strips bolted to Angle Brackets 18 and 20 and the axles are 4" Axle Rods on which Road Wheels are bolted.

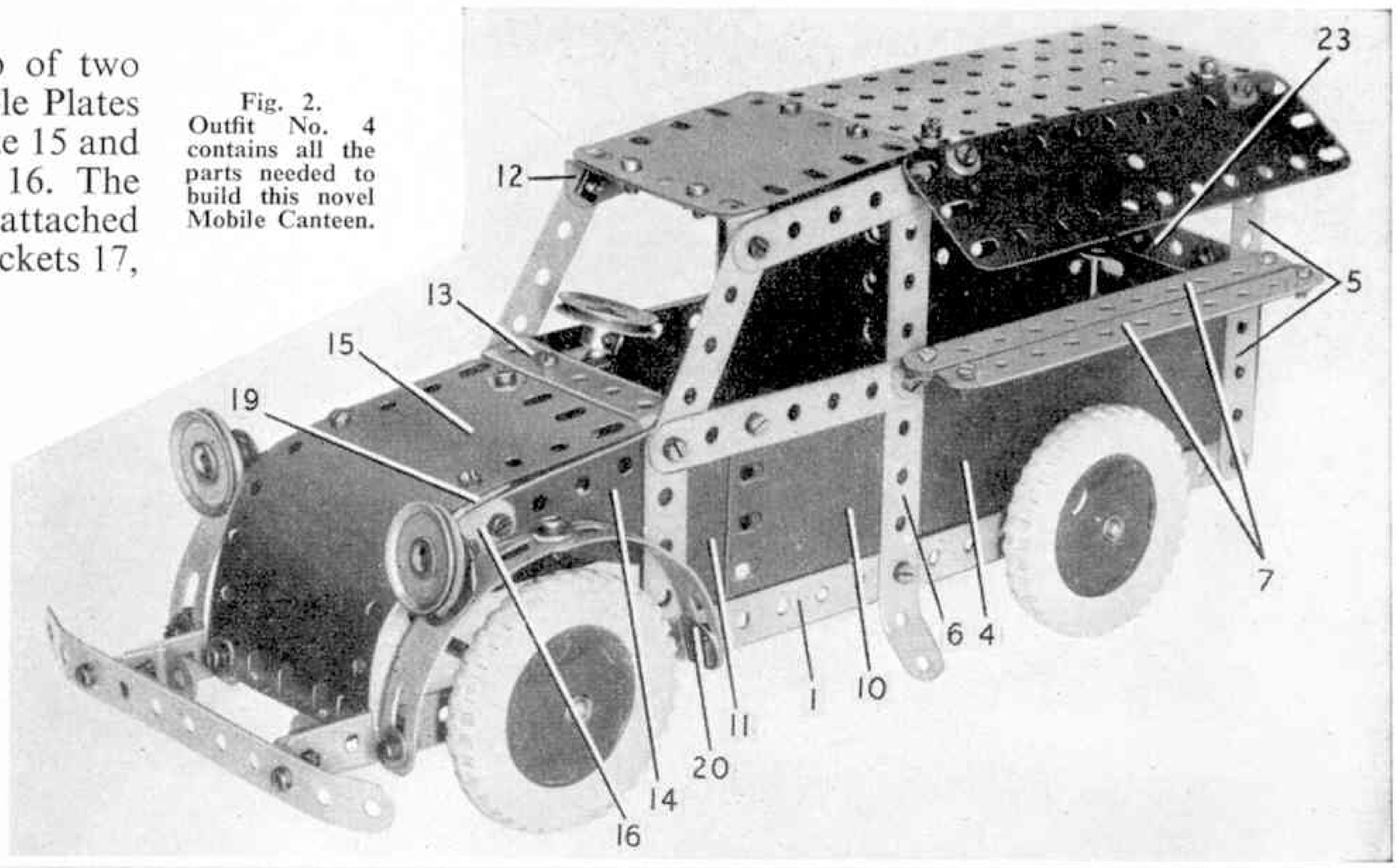


Fig. 2. Outfit No. 4 contains all the parts needed to build this novel Mobile Canteen.

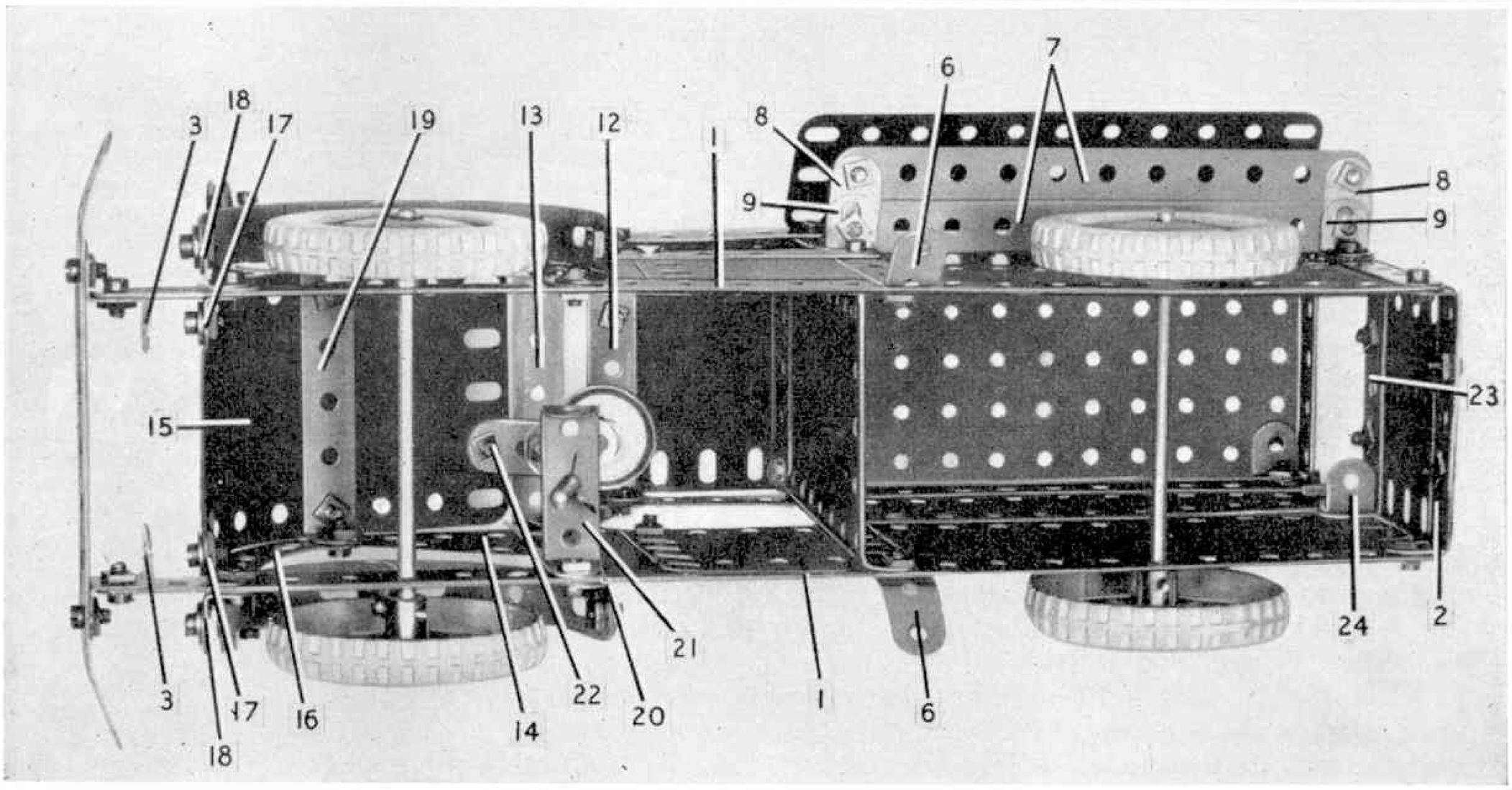


Fig. 3. An underneath view of the Mobile Canteen.

The steering wheel is a 1" Pulley with boss fixed on a $3\frac{1}{2}''$ Axle Rod journalled in a $1\frac{1}{2}'' \times \frac{1}{2}''$ Double Angle Strip 21 and one of the Fishplates 22. A Spring Clip holds the Rod in place. The other Fishplate serves as a means of attachment for the $4\frac{1}{2}'' \times 2\frac{1}{2}''$ Flexible Plate 15 forming the bonnet.

The Headlamps

The headlamps are 1" Pulleys fixed to Obtuse Angle Brackets by $\frac{3}{8}''$ Bolts passed through their bosses.

Parts required to build the Mobile Canteen: 2 of No. 1; 5 of No. 2; 2 of No. 3; 9 of No. 5; 4 of No. 10; 8 of No. 12; 4 of No. 12c; 2 of No. 15b; 1 of No. 16; 3 of No. 22; 1 of No. 35; 62 of No. 37a; 62 of No. 37b; 13 of No. 38; 1 of No. 48; 6 of No. 48a; 1 of No. 52; 2 of No. 90a; 2 of No. 111c; 2 of No. 125; 2 of No. 188; 2 of No. 189; 2 of No. 190; 2 of No. 191; 2 of No. 192; 4 of No. 215; 2 of No. 221.

FOR RAILWAY MODELLERS

In *Railway Modelling* (Arco Publications, price 12/6d.), C. J. Freezer writes in clear, non-technical language of the basic principles of railway modelling. He begins appropriately with choice of equipment, and goes on to consider, in turn, layout planning, trackwork, electrification, the lineside, and so on. There are plenty of references to the ready-to-run models that one can buy, such as those of the Hornby-Dublo System, and attention is given also to the home construction of many things that the miniature railway owner can manage himself. The book is well illustrated, with half-tone photographs and many diagrams.

"SPANNER" TELLS YOU HOW TO BUILD . . .

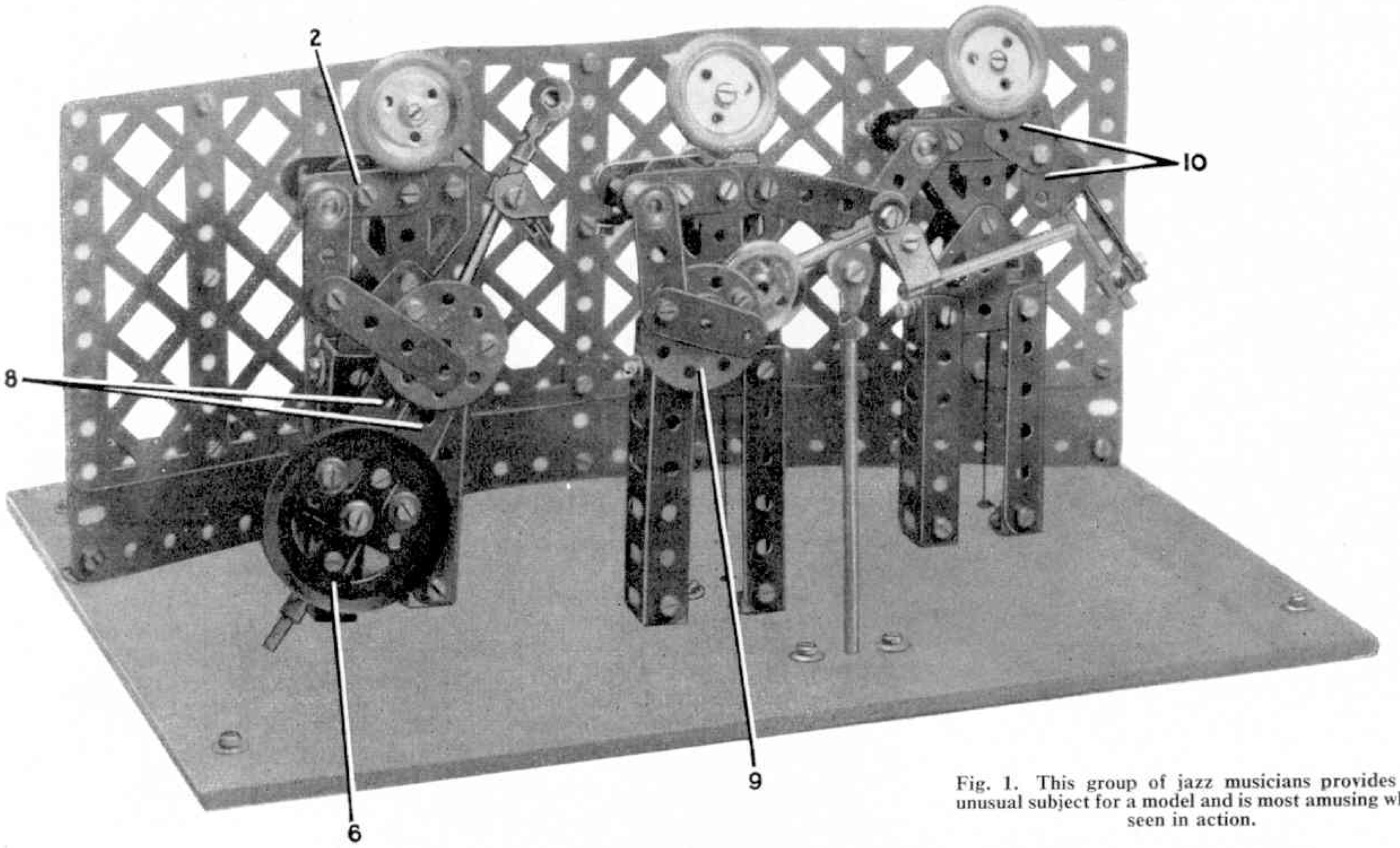


Fig. 1. This group of jazz musicians provides an unusual subject for a model and is most amusing when seen in action.

A Meccano Skiffle Group

ONE of the great features of Meccano, as all its devotees know, is the variety it offers to builders in the way of models—a variety that is, in fact, bounded only by the skill and imagination of the builder. The field of engineering and its associated activities offers possibly the widest range, but now and then we can "step outside" this, as it were, and create something which, while it is on a quite different plane, is interesting both to build and to operate. That is what I have done this month in introducing a modern inflection into the model. It is a group of musicians—not a beat group perhaps, but near enough—who go through a quite suitable series of contortions.

You see the model in Figure 1, and you will notice that the musicians are mounted on a piece of wood which can be fixed to a built-up base frame made from Angle Girders and Flexible Plates and measuring $5\frac{1}{2}''$ in depth, $12\frac{1}{2}''$ in length and $9\frac{1}{2}''$ in width.

The legs of each of the three figures are 3" Angle Girders and their bodies consist of four Flat Trunnions, one pair bolted to the Angle Girders as shown and the rear pair bolted similarly to Double Brackets 1 connected to the top holes of the 3" Angle Girders by bolts. The shoulders are $1\frac{1}{2}''$ Strips 2 arranged as shown on the back and on the front of the figures. Two Double Brackets 3 bolted to the top of each pair of Flat Trunnions join the rear two Flat Trunnions to the front pair, and the necks of the figures, consisting of Couplings 4, are bolted to the $1\frac{1}{2}''$ Strips and Trunnions. The heads are 1" Pulleys with Rubber Rings, and each is joined by a bolt to an Obtuse Angle Bracket that is bolted to the Coupling. The figure on the left is playing a double bass. His left arm consists of two 2" Strips bolted together and also to an Angle Bracket 5 connected to his back. The forearm is bent slightly at the end and a Collar is bolted to the bent portion. A 4" Rod is journalled in the Collar and at each end of this Rod a Rod and Strip Connector is fixed. A 2" Pulley 6 is bolted to the bottom Rod and Strip Connector and this is joined by a $\frac{1}{2}''$ Bolt to a $1'' \times \frac{1}{2}''$ Angle Bracket 7 that is bolted to one of the legs of the figure. Two $2\frac{1}{2}''$ Curved Strips 8 are bolted to the 2" Pulley as shown, and a Wheel Disc is fixed to their upper ends. At the bottom of the instrument, a Rod and Strip Connector bolted to the 2" Pulley, holds a 1" Rod.

The banjo played by the central figure consists of a Bush Wheel 9, a 1" Pulley without boss and a $1\frac{1}{2}''$ Rod journalled in two Rod and Strip Connectors that are bolted to the 1" Pulley and to the left arm of the figure respectively. The left arm is a 2" Strip. A $\frac{3}{4}''$ Washer is held on the same $\frac{1}{2}''$ Bolt as that which connects the Bush Wheel to the bottom of the two Trunnions making up the front of the body, and a Washer is placed between the Bush Wheel and the Trunnion.

The violinist's instrument consists of two 1" Triangular Plates 10 and a 2" Rod

journalled in a Rod and Strip Connector, which is bolted to the two 1″ Triangular Plates. The 2″ Rod passes through a Collar and this in turn is connected by a Bolt and two Washers to a 2½″ Curved Strip. The Curved Strip forms the arm of the figure and is joined to the shoulders by an Angle Bracket.

The upper right arms of the three figures consist of Cranks 11 mounted on 1½″ Rods, and the forearms are constructed as shown. In the central figure the Crank 11 should be spaced by three Washers from the shoulder of the figure and in the other two figures by one Washer. Collars are used to hold the 1½″ Rods in position and each of them carries a ½″ Bolt. At the back of each figure a ½″ Pulley 12 is mounted on a ½″ Bolt lock-nutted to the centre of the shoulders.

THE MECHANISM

A suitable framework is set up as shown in Fig. 3 to house the gearing. The model can be driven by an E15R Electric Motor. The Motor is not shown in the illustration but a ¾″ Sprocket fixed on the Motor shaft should be arranged to drive a 1½″ or 2″ Sprocket mounted on a 6½″ Rod 13 journalled in the framework as shown. A 50-tooth Gear mounted also on this Rod drives a ¾″ Pinion on a 2½″ Rod, which is journalled in two of the 2½″ × 2½″ Flat Plates. Two Bush Wheels 14 and 15, each with a Fishplate lock-nutted in one of its holes, are mounted on each end of the 6½″ Rod as shown, and a third Bush Wheel 16, with Fishplate, is mounted on the inner end of the 2½″ Rod. A piece of Cord is tied to each Fishplate and taken up through holes in the base and round the respective ½″ Pulleys 12 on each figure. The other ends of the Cords are tied to the ½″ Bolts provided at the back of each figure.

When the Motor is switched on, the Bush Wheels rotate, the Cords are alternately tightened and slackened off and consequently actuate in a most realistic fashion the arms of the three figures.

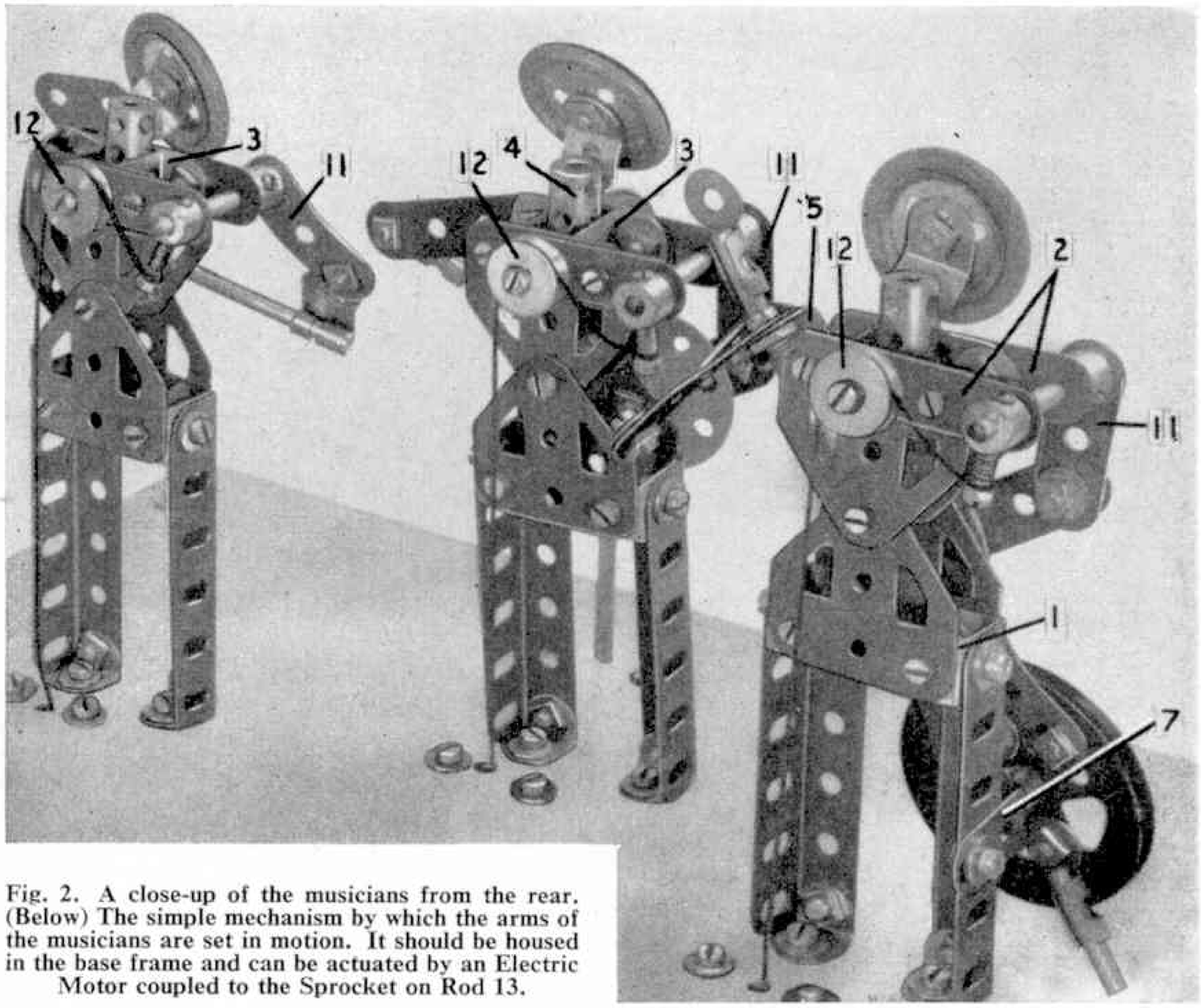
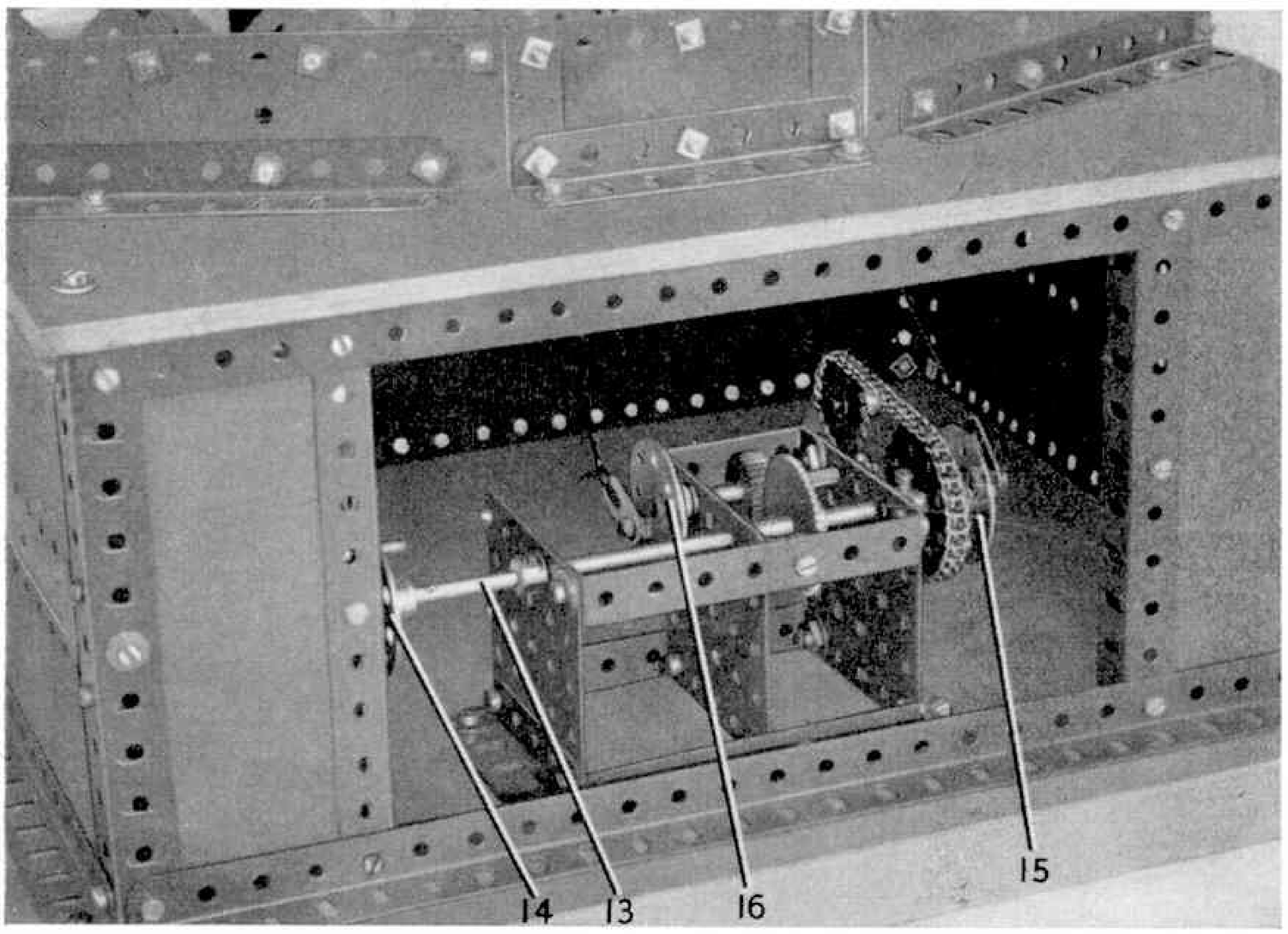


Fig. 2. A close-up of the musicians from the rear. (Below) The simple mechanism by which the arms of the musicians are set in motion. It should be housed in the base frame and can be actuated by an Electric Motor coupled to the Sprocket on Rod 13.



Parts required to build the Model Skiffle Group: 4 of No. 5; 4 of No. 6; 7 of No. 6a; 2 of No. 9a; 1 of No. 9b; 6 of No. 9c; 2 of No. 9d; 9 of No. 10; 12 of No. 11; 7 of No. 12; 1 of No. 12b; 2 of No. 12c; 1 of No. 14; 1 of No. 15; 1 of No. 15a; 2 of No. 16a; 1 of No. 17; 4 of No. 18a; 1 of No. 18b; 1 of No. 20a; 4 of No. 22a; 3 of No. 23; 4 of No. 24; 1 of No. 24a; 1 of No. 25; 1 of No. 27; 120 of No. 37a; 108 of No. 37b; 40 of No. 38; 1 of No. 38d; 1 of No. 46; 1 of No. 48; 2 of No. 48a; 4 of No. 48b; 9 of No. 59; 3 of No. 62; 3 of No. 63; 1 E15R Electric Motor.

A.A. TO OPEN NEW OFFICES

New offices are planned by the Automobile Association as part of a large-scale programme of expansion and decentralisation to be carried out over the next few years.

A major part of the project, involving a capital sum of about £750,000, will be the completion of a group of "satellite headquarters" around London to form a ring between Fanum House, Leicester Square, and the A.A. area offices already in operation at Guildford, Maidstone, Chelmsford and Reading.

A completely new provincial headquarters building is to be opened in York to serve the North and East Ridings, and to help relieve pressure on the A.A. office at Leeds resulting from rapid expansion of A.A. membership in the area.

Other development will include the opening of a further new A.A. office at Norwich, as a replacement for the existing area headquarters which has been outgrown by the increasing number of members in East Anglia.

Side by side with these extensions there will be a general expansion of the A.A. radio network, which at present covers 57,000 square miles. The A.A. radio "umbrella" will, in fact, be widened to about 65,000 square miles and will cover all but the most sparsely populated areas of Britain.



LEARNING TO DRIVE — AT SCHOOL

ONE day last winter, a fast-moving car overtook a driver-trainer car from the Hollywood High School, in America. The student driver had had only two hours of actual on-the-road experience and was, therefore, descending the steep, winding road into the film capital with some caution.

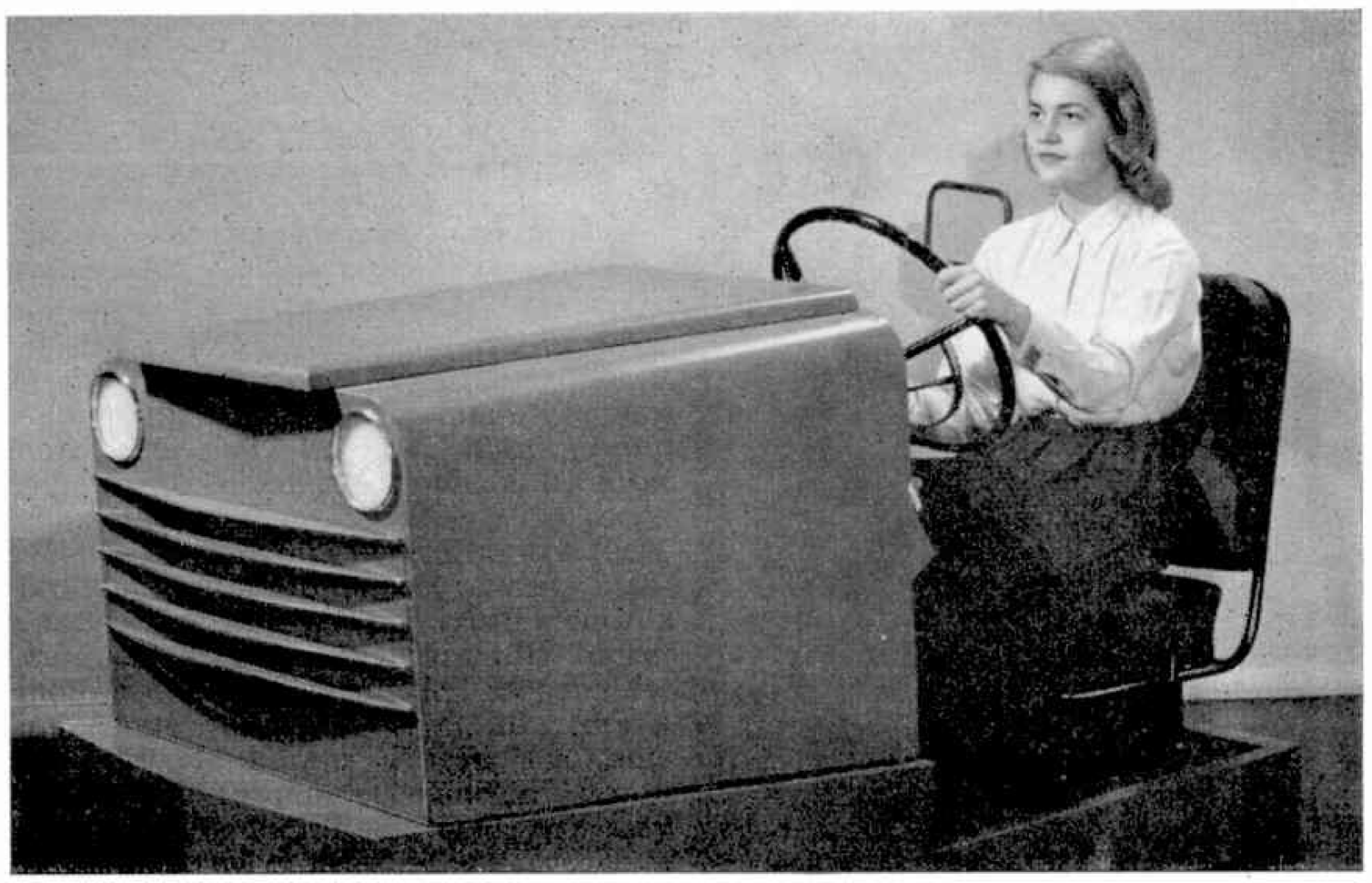
By
IAN S. BALDERSTONE

The driver of the speeding car, disregarding a double white line which warned of a bend ahead, and with no thought of the danger he was creating, attempted to pass. Just as he overtook the student's car, a lorry suddenly appeared, coming round the bend. Panic-stricken now, the impatient driver cut back into the side of the road, heedless of everything save his blind desire to avoid the oncoming lorry.

That he had the space to get back into his own lane without a collision, which might have overturned his own car and hurled the school car down a steep bank, was due to the correct and trigger-quick response of the student driver.

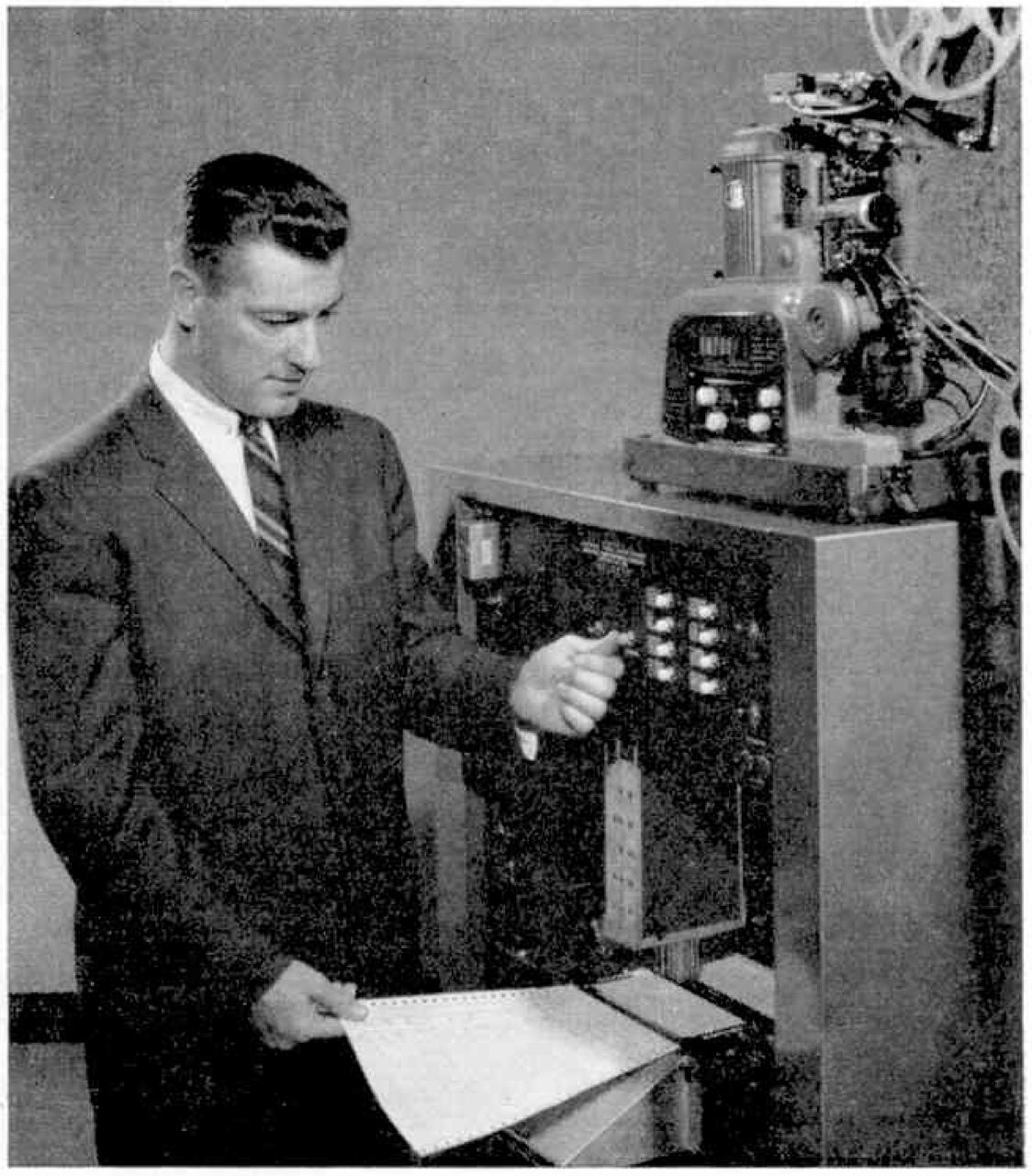
Dr. Walter G. Patterson, the instructor, who was riding in the front seat with his pupil, breathed a sigh of relief.

On the way back to the school Dr. Patterson pondered: for a learner to be able to react so quickly and correctly was something new in his experience. Might not the explanation lie in the training the boy had received on an experimental device, the Aetna Drivotrainer, recently installed at the school? The boy had met several emergency situations on the Drivotrainer similar to the one he had just experienced in real life. He had been drilled in the correct response. When confronted with the real thing he had made a



Classroom driving for 20 students at a time is provided by the Aetna Drivotrainer system installation at Oak Park-River Forest High School, Illinois (above). A control unit scores each student's "driving" automatically as the class drives through the traffic unfolding on the screen ahead of them. Right: A close-up of the wheelless car used by the students.





Left: Driving backwards in the stationary cars used with the Drivotrainer. The student looks into the mirror to see the driveway shown on the screen in the same way as if looking through the rear window of an actual car. Right: The automatic scoring system permits the instructor to follow the performance of each pupil simultaneously at a central recording unit. The actions of each student driver are printed on the score sheet, which also serves as a permanent record of progress. These pictures are reproduced by courtesy of Aetna Life Affiliated Companies, Conn.

split-second response—and a correct one.

The Drivotrainer is a revolutionary new training device which enables student drivers to get behind-the-wheel driving instruction in the classroom, without risk to themselves or others—to say nothing of the paintwork of Dad's car!

In the trainer, students—girls, as well as boys—are taught to drive in small, stationary cars, equipped with all the standard controls found in a real car, by learning to meet traffic situations that are shown on a screen, just as they would appear through the windscreen in real circumstances.

Just as a student pilot would receive part, but not all of his flying training in a flight simulator, so the Drivotrainer is designed to give the student car driver part, but not all, of his training on such devices. The way in which the students *drive* is automatically recorded on a control unit at the rear of the classroom where the instructor can guide the progress of each pupil and correct bad practices as they occur.

Developed by the Aetna Casualty and Surety Company in an effort to pioneer an effective and more economical way to teach students how to drive, the Drivotrainer enables as many as twenty students at a time to be given behind-the-wheel instruction, compared with the one pupil an instructor can deal with in the normal instructional car. In addition to training for everyday driving, the trainer also provides a way of giving drivers practice in meeting such emergencies as the near-collision in Hollywood.

Controls and instruments on the trainer cars have been designed to match those of standard cars. Besides steering wheel, gear lever, clutch, brake pedal and accelerator pedal, the cars have a speedometer, traffic indicators, ignition key, starter switch and even an adjustable seat for the driver.

Under the bonnet

Instead of an engine, however, the Drivotrainer cars have under their bonnets a complete nest of electro-mechanical devices engineered to duplicate in realistic fashion the operation of the controls in a real car. Simulating the hum of a car engine, an electric motor whirs as you operate the starter button, and the more you depress the accelerator pedal the louder becomes the engine noise.

As in standard cars, there is a drag on the movements of the gear lever until it reaches the correct position, where it falls naturally into place. The clutch pedal operates under pressure, even to the point where the driver can feel it take hold as the gears become engaged. When the clutch is let out too quickly the engine will stall and the student must start up again, just as he would in normal driving.

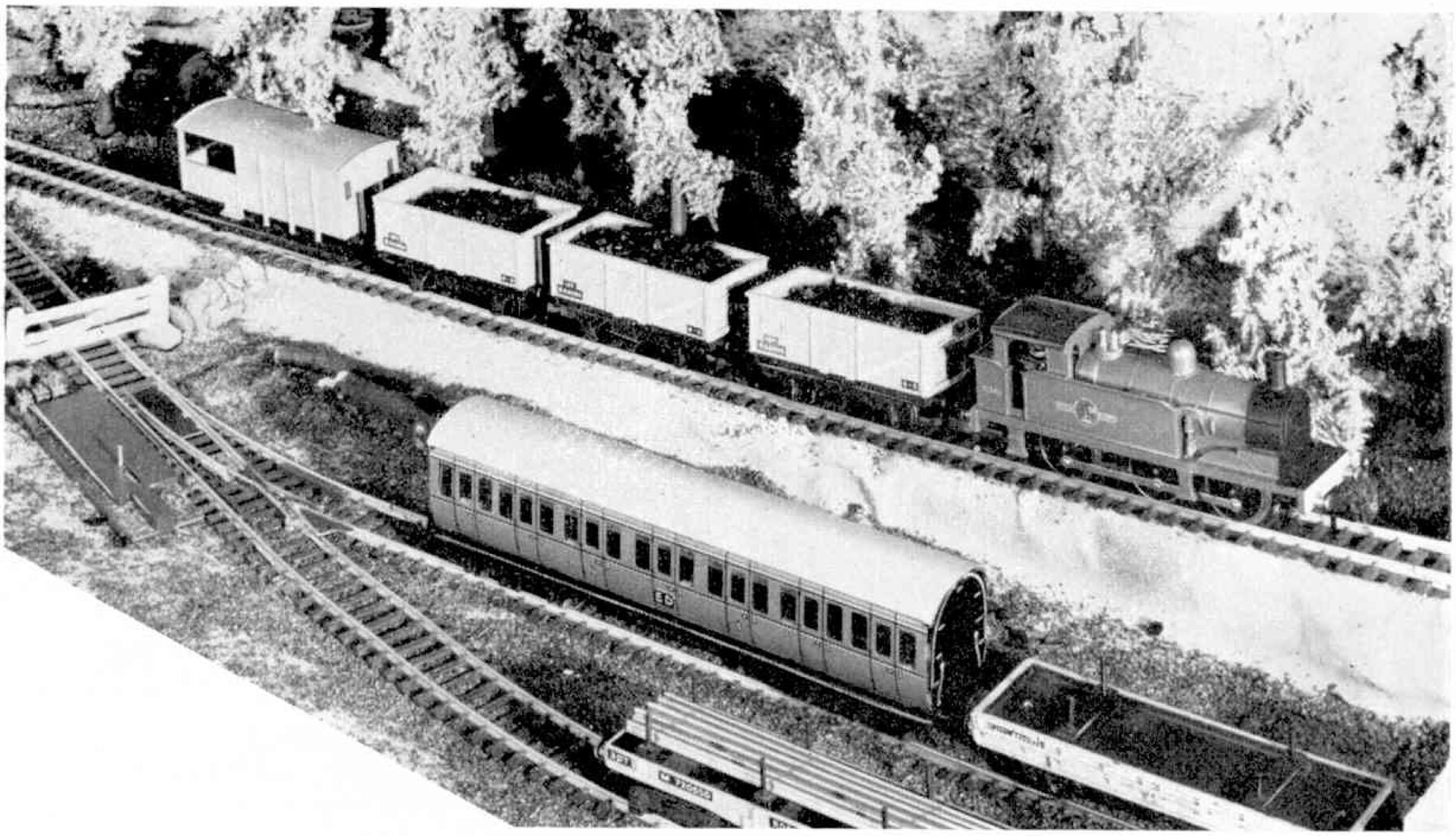
Reversing in the trainer is done in a manner as unique as it is real; the student turns and looks over his right shoulder (left-hand drive) into a mirror positioned so that he can see the road on the motion picture screen at the front of the classroom. He then drives according to what he sees in the mirror, which shows road conditions as they would appear through the rear window of a standard car.

It is claimed that the 22 films produced specially for use with the Drivotrainer constitute the first complete driver-training course ever prepared on film to be centred around behind-the-wheel training in the classroom.

Planned and produced with the co-operation of a committee of driver education specialists from America's schools and colleges, the films take in a greater scope of road problems than most motorists would meet in many months of actual driving.

The films are studded with specially-staged traffic situations designed to develop good driving attitudes and road courtesy. In one drama-packed film, student drivers are drilled in the proper emergency procedures that could save a life, or prevent a collision on the road. Other Drivotrainer films cover starting and stopping techniques, steering on bends and winding roads, turning corners and driving in the proper lane, and many other basic driving techniques. More complex driving problems are covered in the later films, which take in making U and Y turns, driving on hills, diagonal and parallel parking, and driving in city traffic.

HOLIDAY SCENE, AND SUMMER TRAINS



An effective scene on a single line branch. The sidings are occupied by several vehicles forming an Engineering Department work train.

I THINK we can regard the picture above as representing a summer scene, if the flourishing condition of the lineside trees is anything to go by! Its inclusion in this issue is, therefore, quite appropriate, although on some miniature railways there are no recognised "seasons". So far as the railway part of it is concerned, it could be at any time of the year, with the branch line train making its way past the small yard consisting of two sidings in which there is a collection of Hornby-Dublo vehicles, mostly of generally similar character. And it will interest you to know that the scene is actually based on a photograph taken in a truly rural situation during the current holiday period.

The presence of the branch line train with its Hornby-Dublo 0–6–0 Tank Locomotive is readily accounted for, but what are those other vehicles doing, just standing in the sidings? And, in any case, why are the two sidings separated from the main line by the gate? Here we can have a little talk about it all.

The Wagons, and the single Coach, all form part of an assembly representing a work train engaged in Engineering Department maintenance operations in the area. For a Hornby-Dublo train of this kind, Double Bolster and Single Bolster wagons are needed to carry rails if track relaying is in hand, or, alternatively, timber or other similar long loads

Hornby Railway Company

By the Secretary

required for some engineering operation. There may be bridge renewal or something similar in prospect—you will remember the short article on W.R. bridge renewal work in last month's *M.M.*

In addition to the Bolster Wagons, you may well need one or two Open Wagons or Mineral Wagons to carry the loose materials that are often required. There can be an odd Van for carrying tools and so on, or perhaps you may prefer to provide something like the Suburban Brake-second, shown in the picture, to act as a combined tool and accommodation van for the men on the job. They may not necessarily travel in it every day to the job, but it does provide them with quarters while they are there. You will notice that the Coach in the picture bears the letters *E.D.*, signifying Engineering Department. This is a simple addition that you can make yourself if you want to.

Why the gate?

Now what about the yard itself, and why is it provided with a gate? In the original situation on which the picture is based, a possible explanation is that at some time in the past the yard consisted of what are known as private sidings used by a firm for loading and unloading their own traffic. Works, mines, quarries and so on, as well as factories and other premises, frequently have sidings of their own.

"Our" sidings, we will suppose, have been taken over by the railway authorities, but the gate remains. Anyhow, gated or not, the sidings provide a useful place where a work train or any other assembly of vehicles not required in traffic for the time being can be kept. They are not

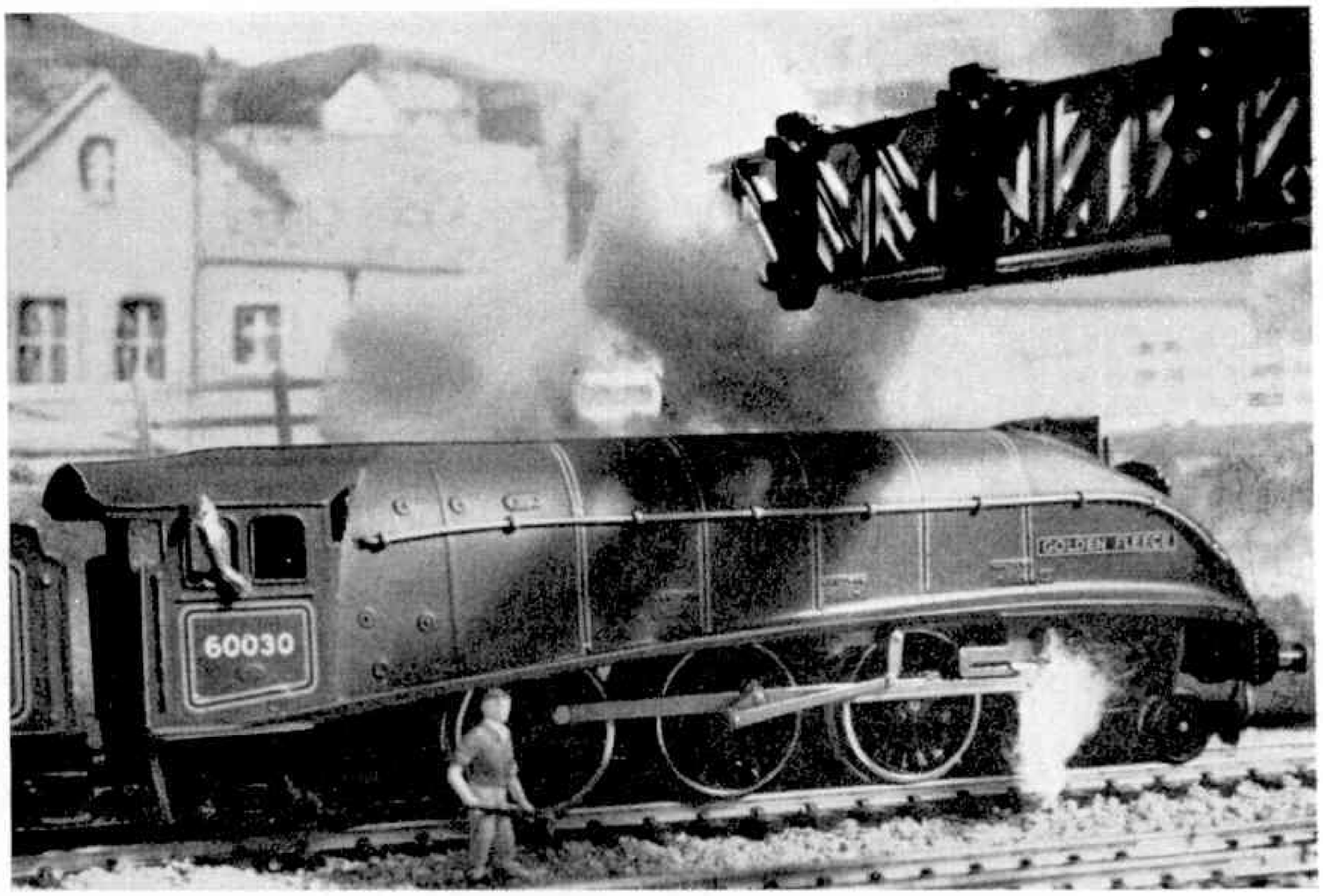
occupying a track used in normal traffic working, as they would be if an ordinary loop or sidings were involved.

Making a miniature gate should not prove too difficult for the average Hornby-Dublo modeller. It can be cut out of suitable card, or built up from strips of cardboard, or, better still, wood. Often, if you are an aero-modeller, you will have bits left over from aircraft kits and similar things and they can in many cases be profitably employed for little railway jobs of this nature.

Holiday-time "Specials"

The present time is a busy one on real railways and I expect that on some Hornby-Dublo layouts, at least, increased passenger traffic will be the rule. Therefore there will be plenty of uses for the items of passenger rolling stock that have been added to the System in recent months. Corridor Coaches, Sleeping Cars and Passenger Brake Vans can all play their part in the assembly of holiday-period "specials" of various kinds.

From the locomotive point of view, those of you who are owners of Hornby-Dublo streamlined 4–6–2 Locomotives, such as *Golden Fleece* or *Mallard*, or any of their predecessors, will be interested to read in *Railway Notes*, in this issue, that engines of this class are being used once again this year in running *The Elizabethan* non-stop between London, King's Cross and Edinburgh, Waverley. There is, therefore, every excuse for putting on a corresponding service in miniature, which will give your Hornby-Dublo A4s a splendid chance of showing their reliability in long-distance running.



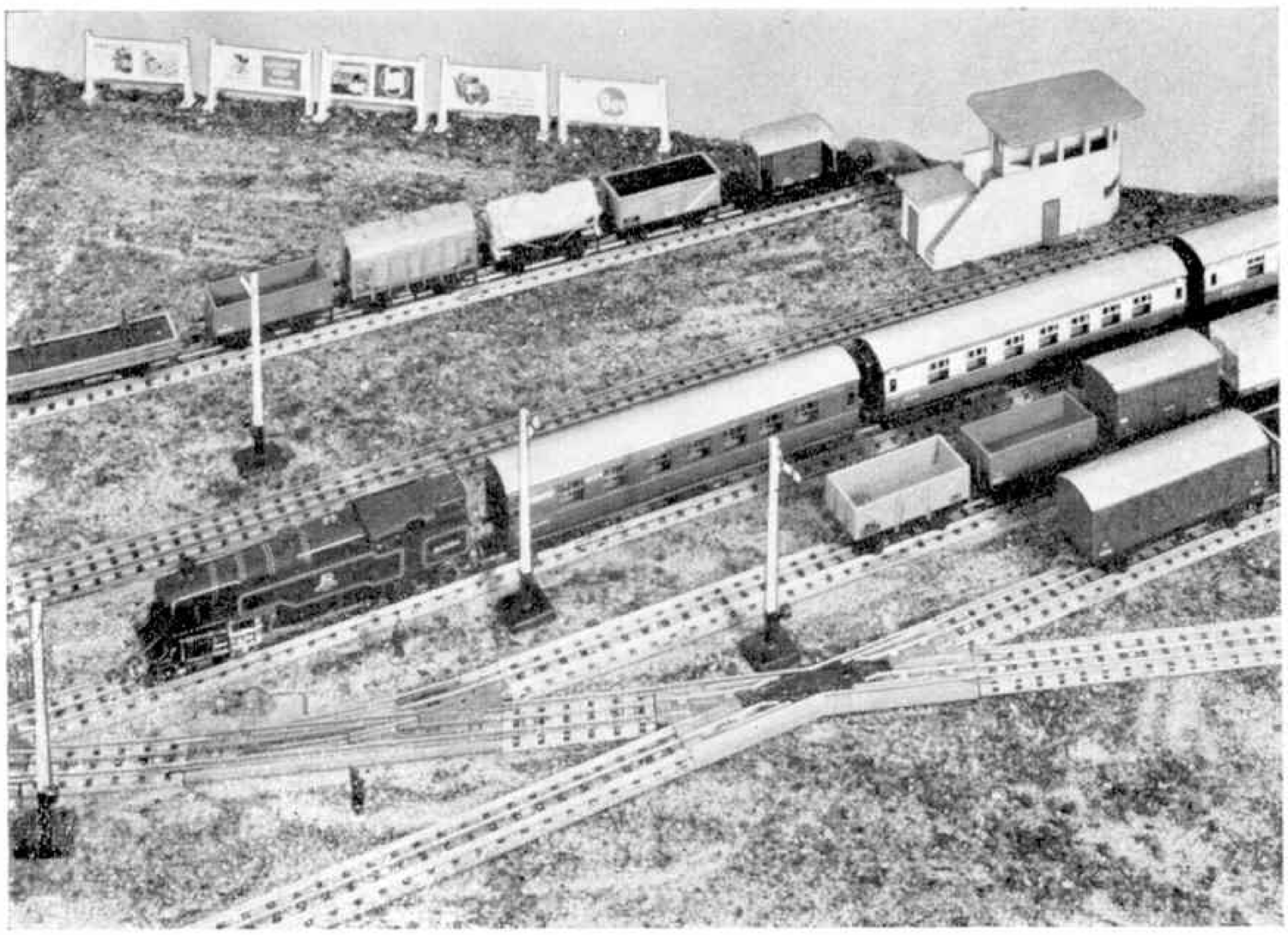
An intensely realistic view of an A4 in miniature. A Hornby-Dublo "Golden Fleece" locomotive about to begin a journey on the layout of S. F. Page.

Naturally, before the inclusion of such a turn in your running programme careful preparation of the engine will be called for, so that the non-stop performance can be regularly achieved. I am not sure whether the *Golden Fleece* locomotive shown in our second picture, that is the upper one on this page, is setting out on such a run, but I am sure you will all agree that the owner of the engine, S. F. Page, has secured an extremely realistic view of his engine.

Although the running of through trains from one Region to another is a regular feature in the pattern of railway operation, trains of this kind are more common during the holiday months. Sometimes they exhibit fascinating variety in the type of stock employed, and it may be possible to see vehicles in several different liveries in the one train formation.

A Hornby-Dublo train of this kind is represented in our third illustration, where the older standard Corridor stock of D22 type, in maroon livery, is used with corresponding D21 vehicles in the familiar W.R. brown and cream. The 2–6–4 Tank Locomotive is a suitable engine for this type of work, at least for part of the journey.

A Hornby-Dublo 2–6–4 Tank on Three-Rail layout, with a mixed train of Hornby-Dublo Corridor Coaches of the older D22 and D21 types.



FOR THE TRANSPORT ENTHUSIAST

Green Goddesses Go East is a 24-page booklet by Ian L. Cormack, M.A., relating the history of the 46 tramcars transferred from Liverpool to Glasgow in 1953-4, and put into service on that city's eastern routes. It describes the vehicles, how they were transported to Glasgow, and the modifications made to them there; and includes a lively account of a Glasgow journey on one of the trams. The booklet has 16 excellent half-tone illustrations. The author is Hon. Secretary of the Scottish Tramway Museum Society, and copies can be obtained from him at 46 Wellshot Drive, Cambuslang, Glasgow, price 2/9d. each, post free.

FLASHES FOR A.A. PATROLS

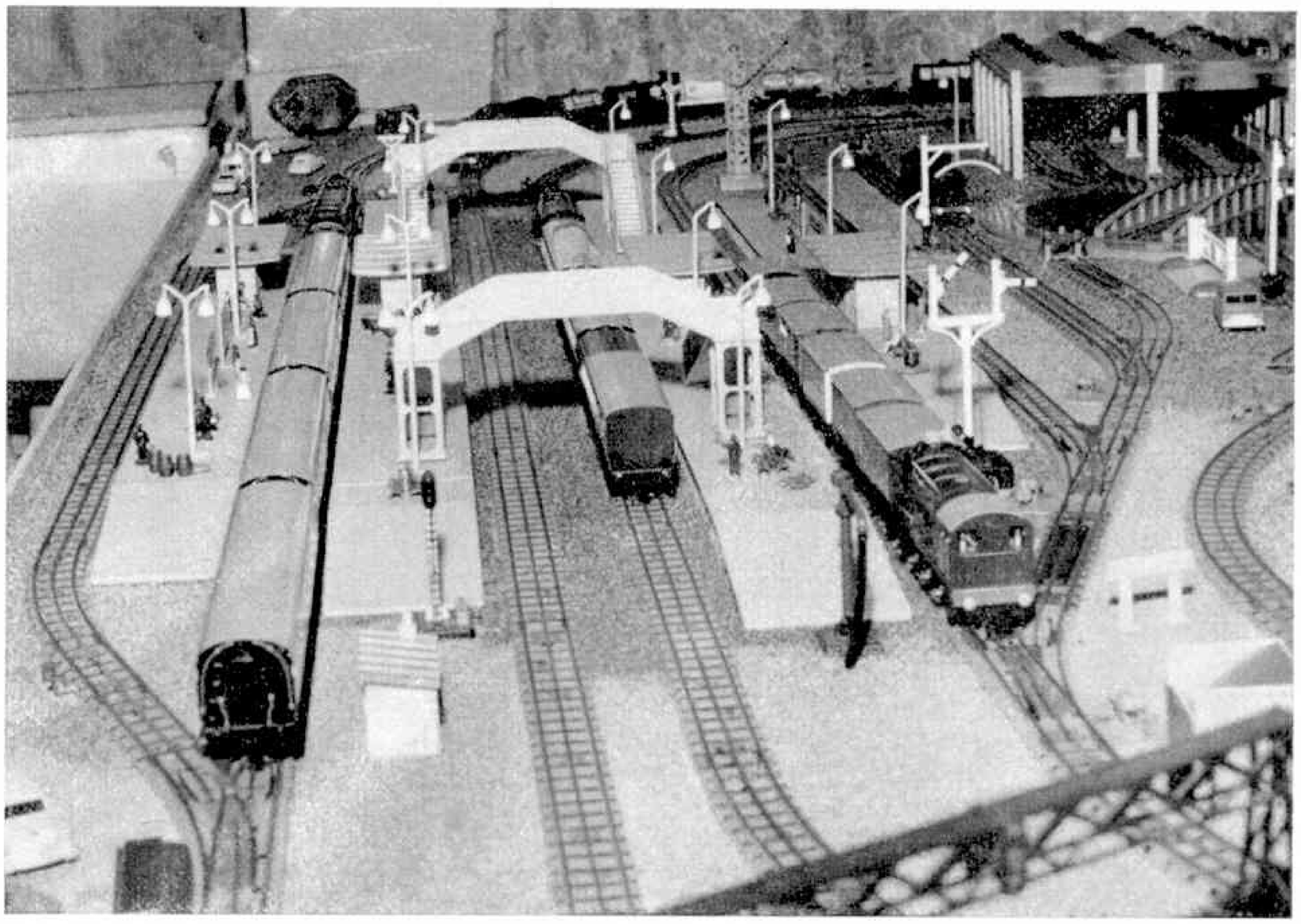
Shoulder flashes are to be introduced for A.A. Patrols, denoting their operational headquarters or the special service to which they are attached, the Automobile Association announce.

Although, in the main, the flashes will bear the name of one of the 34 A.A. area offices—"Leeds Area", "Cardiff Area", "Glasgow Area", and so on—special flashes will be worn by men of the A.A. Highland Patrol and Motorway Patrol, as well as by the London Land-Rover crews.

Three-Rail Layout And A Battery Line

By

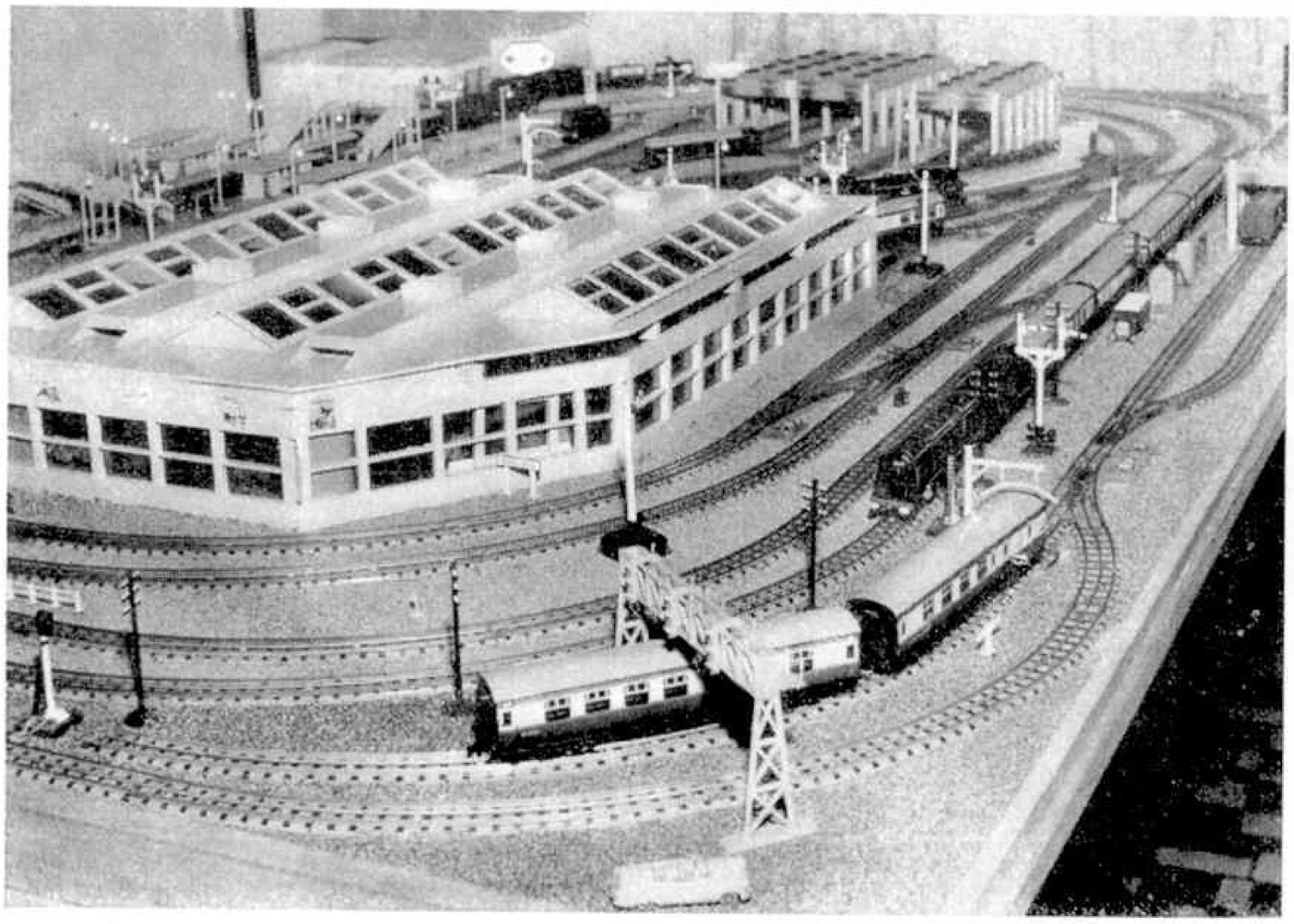
LAYOUT MAN



Above: An end-on view of the station platforms on the layout of F. and G. Jewson, described in this article. The station consists of four island platforms. Below: A view across the layout, showing clearly the remarkable home-built shed in the centre of the system.

THE Hornby-Dublo railway shown in two of our pictures this month has been built up from a single train set and a few additional rails by two brothers, both *M.M.* readers, F. and G. Jewson, of Islington, London N.1. Development of the original layout resulted in the system being put on a baseboard 8 feet by 4 feet, but in the early part of this year further extensions became possible and the area now covered is 12 feet by seven. Such an amount of space offers considerable opportunities for assembling a comprehensive scheme, and our friends have used their chance to the full.

A very large table supports the the greater portion of the layout board, while part of a sideboard also has been pressed into use to support the remainder of the system. It is not always possible to make convenient use of discarded items of furniture in this way, but now and again an opportunity may present itself and certainly, in this instance, the railway owners were quick to take advantage of the chance.



As can be seen from the illustrations, the layout is arranged with Hornby-Dublo Three-Rail equipment and the track, which is screwed to a good, thick baseboard, shows up particularly well. Before any rail laying took place, the whole of the railway area was covered with a suitable grade of bird seed.

Apart from the provision of adequate main line tracks for good continuous running, one of the principal ideas in building up the layout has been to install a satisfactory station, with plenty of space for handling trains. In addition, especial care has been taken to

provide a large number of siding tracks, not only for shunting, but also for accommodating the numerous items of passenger and goods rolling stock on the line.

Running diagonally within the main oval formed by the continuous running tracks are branches from three of the four main lines, opening out into a number of dead-end roads. All but one of these tracks are accommodated under the cover of the very extensive shed building which forms a prominent feature in the middle of the railway.

An impressive block

This home-made structure, built mainly of balsa wood and having glazed windows, serves as a carriage shed, and as a goods warehouse as well, according to requirements. It certainly makes an impressive block, standing opposite to the two engine sheds within the main oval that are built up from standard Kits. Both engine sheds are reached, from one of the diagonal branches previously mentioned, by means of Points in one case and through a standard Turntable in the other, one shed being a simple two-road affair while the other has been built up, by means of the Engine Shed Extension Kit, to form a four-road depot.

The development of the main line station has been most successful; in all there are four island platforms, some with extensions, providing a total of eight platform faces for train working. The two innermost islands, alongside the main lines, are connected by means of two Hornby-Dublo Footbridges, one towards each end of the station. A general view of the premises is quite striking, as is obvious from the upper picture on page 298.

Each of the four main running lines has its own power supply and control arrangements, so that independent operation is readily possible.

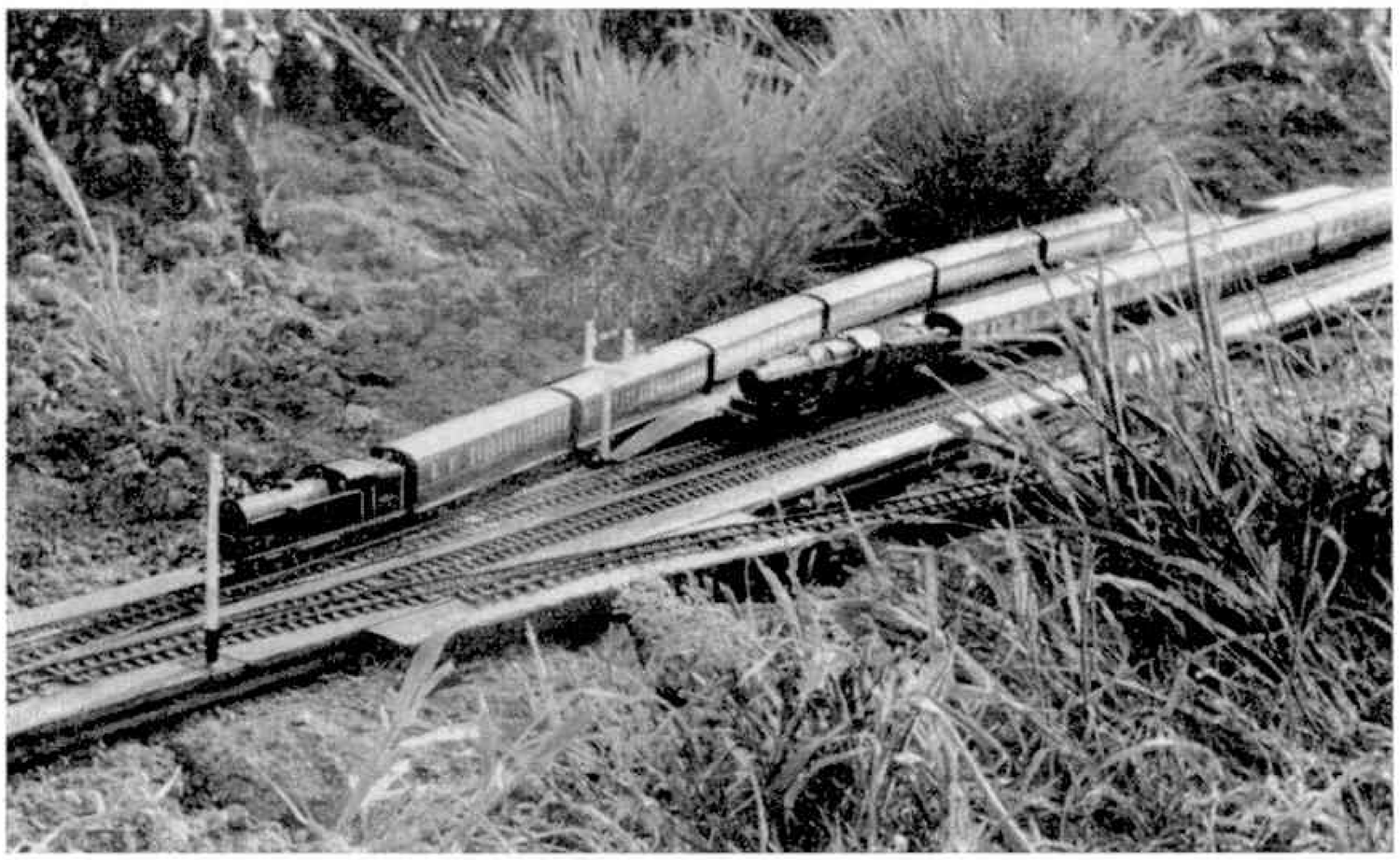
Platform loop

There is a platform loop, and in addition three dead-end roads, alongside the station. All these tracks, like parts of the main lines, are made to form separate electrical sections that can be made live or dead to conform to the requirements of the operating programme.

The positions of the various Points have been well arranged with traffic requirements in mind, and most of the Points, and all the Signals, are electrically-operated. There is also a lighting system that has been developed by the owners of the line and altogether the layout, although a large one, has a neat and well-balanced appearance.

There are more than 20 Hornby-Dublo Coaches, and over 30 goods vehicles, in use and all fit into the extensive shed building mentioned earlier. Incidentally, this building can be illuminated and when it is lit up it looks extremely attractive.

To handle the various trains there are eight locomotives ranging from a *Duchess of Montrose* 4–6–2 to a 0–6–2 Tank. In addition, there are three Hornby-Dublo Diesels, one of each of the types now included in the range. There is, therefore, no shortage of motive power, nor is engine accommodation any problem in view of the generous shed facilities available. In addition to the two engine sheds inside the main oval, there are two others conveniently located alongside the perimeter of the baseboard.



Hornby-Dublo train running out of doors was in progress when R. P. Riisnaes took this photograph of his railway. A stopping passenger train is leaving the station, while at the other side of the platform an express makes ready for subsequent departure.

An open-air line

With our third picture we move, appropriately for this time of the year, out of doors, where R. P. Riisnaes, B.Sc., of Bedford, runs Hornby-Dublo Trains when weather conditions are suitable.

A permanent Hornby-Dublo layout in the open is scarcely practicable for various reasons, but train running outside can often be managed on a fine dry day if your layout board, complete, can be moved from the home to a suitable spot. A board that is carried out of doors in this way should be placed on a nicely level site and must be properly supported.

On the railway shown here, dry battery operation is employed for outdoor running, a method of operation that avoids any problems involved in connecting power units or transformers with A.C. mains supplies and so on. From the safety point of view mains operation for outdoor running is not advisable, but if it is to be used I must emphasise that a competent electrician **must** be called upon to arrange suitable cable and connections between the mains point and the plug on your power unit or transformer cable. This is NOT a "Do it yourself" job.

WITH THE SECRETARY

Club and Branch News

MAKE A NOTE OF IT

August is the month when most Club and Branch members in Great Britain are away on holiday; a time to forget about school, homework and examinations. Whether they are holidaying by the seaside, in the country, or touring abroad, I hope that members will see that they always have a notebook and pencil handy so that they can make useful notes and, if desirable, rough sketches of anything they see that might make a good subject for a Meccano model next Winter, or an appropriate scenic addition to the Branch Hornby-Dublo layout.

CLUB NOTES

ASHTEAD FREE CHURCH M.C.—The story of Electricity, from power station to switches, was told by John Rennie at one meeting, and at a later Talks evening M. Cippax gave a "postscript" on the subject; D. Davy spoke about space travel, R. Nagel told the story of boats and B. Mayes discussed model boats. A table-top photography evening by Mr. Hiscock was very popular, and an outing to the River Fire Station, which included being shown over the Fire Station and the Fire Float, was a great success. At one Senior Section meeting a pictorial quiz on Ashtead was held, when the members present quickly discovered how little they knew about their own town! *Secretary:* B. Mayes, 54 Newton Wood Road, Ashtead, Surrey.

30th BRISTOL LIFE BOY TEAM M.C.—An outing to Sand Bay, near Weston-super-Mare, by a party of 41 boys was much enjoyed. The Life Boy team will give a musical marching display as the opening item at a garden fête being organised by the Teyfant Parents and Teachers' Association. Table displays illustrating Life Boy activities, including Meccano model-building, will be a feature of the fête. *Leader:* Mr. G. H. Horlick, 44 Hartgill Close, Hartcliffe, Bristol 3.

AUSTRALIA

MAYLANDS M.C.—The Annual Presentation Night was well attended by members and their parents, with a sprinkling of old members. As usual, Mr. G. Winnett—an ex-member of the Club—took charge of the presentations. History was made on this night, as the first "A" certificates ever awarded were presented to Warren Bransby and Alan Vidler, after the certificate scheme had been in operation for almost ten years. In accordance with a promise he made several years ago to award a special trophy to the first member to earn an "A" certificate, the Leader presented it to Warren Bransby. As usual, Mr. Montagu provided an excellent programme of films to complete the evening. This important annual event was reported in the State's morning newspaper.

In recent model-building, Keith Bell gained the "Model of the Month" trophy with a neat miniature go-kart operated by a small electric motor and incorporating a rack and pinion steering mechanism. *Secretary:* Warren Bransby, 90 Crawford Road, Maylands, Western Australia.

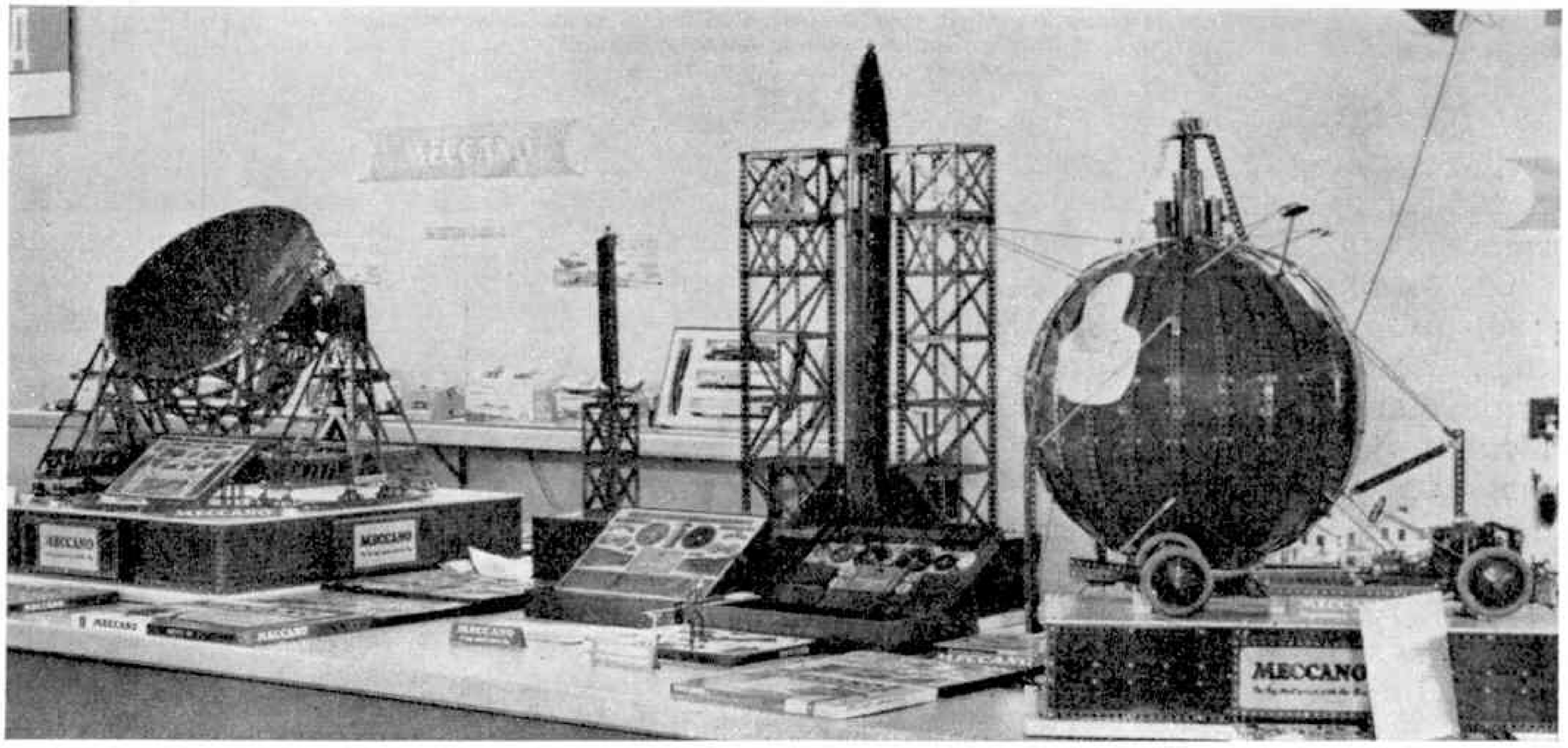
INDIA

MYSORE M.C.—At the time of writing, plans are in hand for celebrating the Club's eighth anniversary, when there will be a special display of Meccano models. Places of interest visited recently have included the Central Food Research Institute, where the Club Secretary is a member of the staff. Members showed great interest in the various processes undertaken in the chemical engineering block of the Institute. On a picnic outing the party of 18 members was honoured by being accompanied by the Club's Vice-President, Mr. Madhava Shenoi. The party left Mysore at 6.30 a.m. by special bus and returned by 9.30 p.m., having visited several places of Indian historical importance. *Secretary:* Mr. A. P. Krishna Murthy, B.Sc., 955 "Srinivasa", Lakshmipuram, Mysore 4, India.

NEW ZEALAND

ST. JOHN'S (DUNEDIN) M.C.—At one meeting Canon Harbour, the Club President, introduced Mr. Brian Ayres, a missionary boat-builder who was on a visit to St. John's Church. In his boyhood Mr. Ayres was a keen Meccano model-builder and is still very interested in the hobby. He closely examined members' models in the Club room, and asked questions about Meccano as it is today. It has been decided to hold a Club model-building competition as soon as a forthcoming Exhibition is over. The President has suggested that the Club should arrange more outdoor events outside the usual Club hours. *Secretary:* William Earl, 60 Ann St., Roslyn, Dunedin, New Zealand.

The illustration on the right shows part of the Meccano display at the recent British Trade Fair held in Moscow. This section of the Meccano exhibit was devoted to space age developments and is referred to in the article Meccano Goes to Moscow on page 277. A further picture appears on the Editorial page.



PENCIL POINTS

● At school, at work, in leisure time, people use pencils almost every day. But how much do they know about them? In this article the author relates the history of the popular "black lead".

PENCILS are easily the most taken-for-granted aids to civilisation we have. Every year throughout the world at least 4,000 million of them are made to be sold, begged, borrowed, stolen, lost, broken, chewed or just used up. In Britain alone about 250 million disappear annually —about five for each person in the country—and everywhere the demand for them is growing.

Yet, the universal description of "lead pencil" is a complete misnomer, although it does, by its very inaccuracies, give clues to its history.

The word pencil itself comes from the Latin *penicillus*, literally "little tail", the name given by the Ancient Romans to the fine-pointed brush they used for writing and drawing on papyrus. In those days, following the example of the scribes of Ancient Egypt, both the Romans and the Greeks used a small lead disc for ruling

By David Gunston

guide lines on the papyrus to keep their lettering even. Called a *plumbum*, from the Latin word for lead, this useful device later became confused in name with the fine slender rod of lead used for scribing lines that came into use later—primarily as an artist's tool. Beautiful drawings, finely executed in pale grey and dating from about the fourteenth century, were produced with such rods of lead, zinc or silver, known as pencils.

But the true wooden pencil so familiar today did not appear until the sixteenth century. The first written description of such a writing tool is to be found, oddly enough, in a learned "*Treatise on Fossils*," by one Conrad Gesner, of Zurich, but his account proves that by 1565 writing rods in wooden cases were known to scholars.

THE real impetus to the pencil's progress came with the discovery that it was graphite, not metallic lead, that formed the best writing material. This innovation, dating from about 1550, has a touch of romance about it.

One morning, up on the craggy pastures of the English Lake District in Borrowdale, near Keswick, the shepherds were out, anxious for the safety of their sheep following a violent storm the previous night. Up on the mountain called Glaramara, in the Seathwaite Valley, they noticed that a number of trees had been blown down, tearing away the mountain subsoil as they fell and leaving exposed to view large masses of strange black material.

Pieces of this odd stuff were later dug out, and the shepherds thought at first that it was coal—but it would not burn. Quite by chance they discovered it was excellent for marking sheep. It was, of course, an untouched deposit of graphite, or pure soft black carbon of probably volcanic origin.

By 1564, in the reign of Queen Elizabeth I, the value of the stuff appreciated. The mine was taken over by the Government and the value of graphite became fantastic. It was mined only six weeks each year, and armed guards escorted the stage coaches carrying it from Keswick to London. There, as well as being made into proper wooden pencils, it was also found to be most useful in medicine, especially by veterinary surgeons.



EXPORT of the ore was strictly prohibited, and the newly-formed English Guild of Pencil-Makers enjoyed a world monopoly in the sale of the finished pencils, for which they hand-carved wooden cases.

The Cumberland graphite boom continued for some time. The rough slabs unearthed from the mine were first sawn into sheets, then into square leads. These were then fitted into grooved wooden strips, and a thin, wooden slat was glued on top to make the fourth side of the pencil.

Naturally, other pencil-makers cast envious eyes on the Lakeland deposits. Other graphite sources were discovered in Mexico and elsewhere, but they were not of the same purity. The next step was to find a suitable binding agent to re-form the powdery, imperfect ore into usable sticks. The Germans mastered this difficulty by mixing the graphite with sulphur and antimony, and the resulting pencils, known as "white lead sticks", competed favourably with the English product.

It was a German scientist, K. W. Scheele, who, in 1779, analysed the "plumbago", or "blacklead", as it was called, and found it to be a form of pure carbon, and not lead at all. Ten years later A. G. Werner suggested the name "Graphite", from the Greek work "to write", and this was adopted, although, of course, we still talk of our lead pencils.

So far, however, the pencil was an expensive and clumsy writing instrument. Artists preferred a sharpened lump of graphite, wrapped in sheepskin, and always the pure graphite was smudgy to work with.



IT was not until 1795 that the basis of modern pencil manufacture was hit upon. At that time war had cut France off from both the English and the German sources of pencil supply, and Nicholas Jacques Conte, an officer in Napoleon's Army, was instructed to perfect a substitute for the natural English, and the secret German, pencil leads. He mixed powdered graphite with powdered clay and then fired the mixture, like china pottery, in a kiln. This not only made a serviceable lead, but enabled him to vary the writing textures from hard to soft by decreasing the proportion of clay.

So Napoleon got his pencils for planning his campaign, and eventually the world got its modern pencil-making process. By the middle of the last century pencils were made commercially by this method in both Europe and America, where H. D. Thoreau was a pioneer, although until about 1860 the leads were still made square in shape, long after the reason for it had vanished. By 1880 the Borrowdale mines had ceased to yield pencil graphite, which is now imported from Mexico, Ceylon, Korea and Madagascar. The soft "cheesy" cedar wood now favoured for the cases comes from Canada and East Africa.



PENCILS are nowadays made in rows of seven, and although the whole of the work is now done by machinery, the basic principle—lead glued in groove, slat glued on top—remains.

From 7B to 9H there is now a pencil for every need, decorated with, perhaps, five coats of cellulose lacquer and with the maker's name stamped on with 14-carat gold leaf. Needle-pointed on a special sharpener whose blades revolve 12,000 times a minute it may be traditionally black, or any one of 72 colours, with a life of . . . who knows?

Few of us write the half-million words of which every standard seven-inch pencil is capable, yet we still need an average of at least five pencils every year. Pencils have puzzles, as well as points.

BARGAIN DISCOUNT APPROVALS

The Approvals for the really keen collector who requires a first-class service offering modern and new issues (including QE). Nearly 200 different in each selection in singles and sets, at moderate prices and with a generous discount off purchases. We pay outward postage. Commonwealth only or Whole World selections. "Wants" lists welcomed from regular customers. We offer the same service to all customers, junior or adult. Send for a trial selection today—there's no obligation to buy, and we never send more unless you ask for them. (No stamps sent abroad.)

THE BIRKDALE STAMP COMPANY, 104 Liverpool Road, Southport, Lancs.

Postal Business Only **(NO CALLERS)**

30 Diff. New Zealand FREE

This fine packet Catalogue Value over 10/–, including 3/– Q.E., FREE to all asking for Approvals and enclosing 3d. stamp.

SPECIAL OFFER OF SETS

Cyprus
1955 2m–50m 11 values **4/6** set
1960 Map Set .. **5/–** set

Nigeria
1960 Independence, 4 values .. .. **3/–** set

Malta
St. Paul .. .. **8/6** set

India
1957 Children's Day **1/3** set

New Zealand
2d. Xmas Stamp .. **3d.**

R. J. SMITH & SON
81 Redbreast Road, Bournemouth

100 Different Stamps FREE!

Plus Super Perforation Gauge to all applicants asking to see my famous ½d. upwards Approvals. British Colonial or Foreign. Don't delay, write today enclosing 4½d. in stamps for postage.

C. T. BUSH (MM8),
53 Newlyn Way, Parkstone, Poole, DORSET

SUPER KILOMIX. ¼ lb.—**6/9d;** ½ lb.—**13/6d;** 1 lb.—**23/–.** Terrific variety. Special returns scheme for your duplicates. Sent post free.

APEX STAMP CO. (M), 9 The Parade, Twerton, Bath

OUTER SPACE PKT.

A magnificent collection of stamps showing Man's Conquest of Space, the fine Russian stamps commemorating the first SPACE MAN, stamps showing Rocket to Venus, Rockets to the Moon and man-made satellites in orbit, Cosmic Rocket stamps from Czechoslovakia, Formosa, Rockets, this packet is a MUST. If you request our approvals it is free to all who send 6d. postage, otherwise the price without approvals is 1/–.

OXFORD STAMP SHOP
15 HOLLYBUSH ROW, OXFORD

FREE! SINGAPORE New Issue

A bumper packet of **British Commonwealth** containing **Singapore** National Day 1961, **Jamaica** Stamp Centenary, **Malaya** and **North Borneo** new issues and 50 other worth-while Commonwealth stamps, will be sent **Absolutely FREE OF CHARGE** to all applicants for our "Tip-Top" Discount Approvals (6d. in 1/– discount). Please enclose 3d. stamp towards postage.

M. THEOBALD (160)
4 Sipson Road, West Drayton, Middlesex

32 PAGE ILLUSTRATED "STAMP FINDER" BOOKLET

absolutely FREE to all requesting our PRIORY APPROVALS. World-wide selections and sets. FREE GIFTS—BEST DISCOUNTS—QUALITY STAMPS. Please send 3d. postage.

THE PRIORY STAMP COMPANY
(Dept. M), 86 Pauntley Road, Mudeford, Christchurch, Hants.

INTERESTING OFFERS:—

PACKETS—All different—Best Quality

10	Abyssinia ..	2/–	25	Colombia ..	1/2
100	Australia ..	5/6	100	Ecuador ..	7/4
25	Barbados ..	4/6	50	Honduras ..	8/6
50	Bolivia ..	4/4	200	British Empire	3/6
10	Bosnia ..	1/6	500	World ..	5/–

No Free Stamps but satisfaction at the lowest possible prices. Overseas orders welcome. Lists Free. Postage 4d. **H. V. JOHNSON & CO.** P.T.S.
78 Dale Road, Wickersley, ROTHERHAM



1/9 PKT. of LARGE GHANA for 3d. POST FREE

To all Collectors asking to see our **Quality** approvals. (Without approvals Price 1/9d.) Monthly selections a speciality. Adult collectors catered for. Particulars sent of **"WRIGHTS (New) JUNIOR STAMP CLUB",** Admission Free—Fine Gifts. (Postal Sec. Est. 1897). *Tell your parents.*

WRIGHT'S STAMP SHOP
Canterbury Ltd. (M.53), Canterbury, Kent

PICTURE CARDS

We offer complete sets in clean condition.

50 Planes	2/9	50 Trains	2/9	50 Animals	2/9
50 Birds	2/9	50 'Space'	2/9	50 Footballers	2/9
50 Ships	2/9	50 Fishes	2/9	50 Coins	2/9
50 Cars	2/9	50 Cricket	2/9	Any 3 sets	6/6

100 different cards 3/– post free

Send 1/3 for 48-page CATALOGUE with over 350 illustrations.

FREE MATCHBOX LABEL



This scarce EGYPTIAN label sent FREE to all those sending 3d. for our MATCHBOX LABEL APPROVALS.

MATCHBOX LABEL ALBUM
to hold up to 1200 labels 6/– post free.

E. H. W. Ltd. (Dept. M)
12 SICILIAN AVENUE, LONDON W.C.1

2 ST. VINCENT FREE to everyone ordering one of these PACKETS

25 diff.		50 diff.		100 diff.	
Bosnia ..	4/–	Canada ..	1/6	Australia ..	6/–
Cyprus ..	4/6	Croatia ..	3/9	Finland ..	3/9
Hong Kong	3/9	Greece ..	2/–	India ..	3/–
Jamaica ..	2/9	Malaya ..	3/6	Norway ..	3/6
Malta ..	3/–	N. Zealand	3/6	Russia ..	6/–
Zanzibar ..	8/–	S. Africa ..	2/9	U.S.A. ..	4/–

Please tell your parents
Postage 3d. extra C.W.O. LIST FREE
Battstamps(SV), 16 Kidderminster Rd., Croydon, Surrey

50 PICTORIAL STAMPS FREE

This packet of stamps is given absolutely **FREE** to all genuine applicants for my superior used British Colonial Approvals enclosing 4½d. in stamps for postage. Overseas Applications Invited.

D. L. ARCHER (M),
2 LITCHFIELD WAY, BROXBOURNE, HERTS.

* 58 FREE *
3 diamond shaped Costa Rica 1960 Olympic Games, plus 55 others. Request approvals. Send 3d. postage.
SELECTIVE STAMP SERVICE
124 West Street, Ewell, Epsom, Surrey

SERIOUS COLLECTORS SHOULD SEND A POSTCARD FOR FIRST-CLASS APPROVALS SELECTION. STATING CHIEF INTERESTS.
H. B. LANG
BURNBANK-MAUCHLINE-AYRSHIRE

GREAT BRITAIN 10/– QUEEN ELIZABETH
This valuable high catalogue stamp offered as a **Free Gift** to all approval applicants. Postage essential.
YULWONTMOR STAMPS (Dept. M)
54 Compton Avenue, Leagrave, Luton, Beds.

BRITISH Colonial, Foreign Spacefillers, 15 a 1d. Pictorials. Commemoratives, Colonials, Foreign ¼d., ½d., 1d. Postcard secures hundreds approvals.
PILGRIM
Priory View Road, Moordown, Bournemouth

TRIANGLE Pkt. 30 FREE COLOURED BUTTERFLIES

TRIANGLE MOLUCCAS, China Peace Dove, Monaco, Lourdes Miracle, Diamond, and 26 other stamps free. Send 3d. post & request appvls. **ROSEBERY STAMP SERVICE (Dept. K), 37 Rosebery Rd., Epsom, Surrey**

A SELECTION OF MY DISCOUNT APPROVALS
Sent on request. 3d. postage. Free Packet.
GBN(M), 41 Collins Road, WEDNESBURY, Staffs.

FREE, 6 SETS CATALOGUED 16/–
To all approval applicants. 3d. postage. **G. I. Pattle, "Pattlesden", Rattlesden, Bury St. Edmunds, Suffolk**

FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 305

For Stamp Enthusiasts

Thematic Collecting

By F. E. Metcalfe

WHILE it is true that, so far as British collectors are concerned, the stamps of the Commonwealth are most popular—especially the issues of the KGVI–QEII reigns—it is a fact that thematic collecting is at least holding its own. I am getting proof of this all the time in the letters I receive. These letters are mostly concerned with one angle of the subject—what should the writer collect?

Some time ago I read that more than 500 themes are being collected, and I imagine that American ingenuity is responsible for having thought up most of these, for although many British collectors are interested in this field the Americans are, if anything, even more enthusiastic. Over there, catalogues have been published devoted to the more popular subjects, such as flowers, ships, aircraft, etc. But I think that the greatest fun is to be had by picking



something original, and it is certainly true that it is not necessary to be on a well-beaten path in order to win a competition, even one of national status.

For instance, as most collectors know, London has a yearly stamp show entitled "Stampex", and prizes are given for various classes. Naturally, competition is very keen, but this year the thematic prize was won by a collector who must surely be the only one in the world to have tackled the subject he had chosen. Actually, he was not a thematic collector at all, but his Society—which had to sponsor his entry—left the choice of subject entirely to him. So he took a number of sheets from his specialised collection of Norway and worked on the theme of the lion, which appears on many Norwegian stamps. While it is true that there were a few people who thought that the result, perhaps, hardly justified the entry's inclusion in such a competition, the judges had no doubts about its eligibility and awarded it the prize. Naturally, the Crosby Society of Lancashire, the winner's sponsors, much appreciated the honour, particularly as they are a relatively small Society.

Of course, among *Meccano Magazine* readers I can imagine that aircraft and such things will be the most popular. In fact, I have seen one or two such collections,



and jolly interesting they were, not only to one who is a collector but also to those who are normally not interested in postage stamps. And that is a big point to take into consideration.

You know, stamp collecting possesses great appeal for some people. So much so that quite often they carefully keep to themselves the fact that they collect at all. It is not so long since a collection was sold, by auction, which fetched many thousands of pounds; yet, it is said that it was only when the owner died that even his close friends learned that he had collected stamps. Now I don't think that such an attitude is at all healthy. Nor do I think that such a collector gets all the fun there is to be obtained from the hobby by hugging—metaphorically at all events—his stamp album to his breast. For one thing, in doing so he prevents others from sharing in his enjoyment.

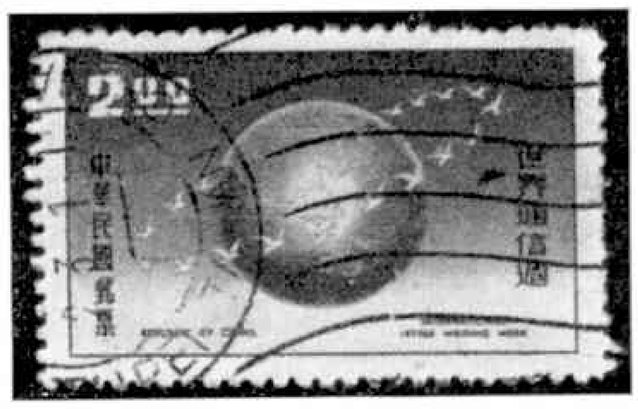
A thematic collection, if well mounted and written up, can interest even friends who are not stamp collectors, and what could be nicer? Let us take the subject of aircraft, for instance. There are so many stamps depicting 'planes that it is quite easy to get sufficient together to make a brave show. It is true that some of the aeroplanes depicted would never rise off the ground, and may possibly be a not-very-knowledgeable artist's conception of what a 'plane is supposed to look like. But I'll wager that none of these "impressions" will deceive many *M.M.* readers. My word, do they know their stuff! I remember some time ago getting the Editor to illustrate a particular stamp,



and in my Notes it was mentioned that I did not know what 'plane was depicted. I think, from the correspondence received, that I must have been about the only *M.M.* reader who didn't know!

But to get back to my main topic. What is your job? How about a theme which, in some way, links up with it? But, you may answer, "I work in an office". Well, that office will be connected, surely, with some form of industry. It is not so long since I saw a quite enthralling collection formed by a clerk in the office of a firm of meat importers. He had gathered stamps from countries as far apart as Papua and Argentina—a grand show.

Another clerk I know, who worked for a tailor, had a costume collection. He ignored mounting the countries in alphabetical order, but made the actual garments the men wore (it was a strictly male collection) the criterion. He has been finding so many appropriate stamps that he hopes, by next year, to have a go at his Society's yearly competition. Now his sister, who works in a large store devoted mostly to ladies' wear, has been bitten by the collecting bug, and you can guess what her theme is!



However, there is just one point I would like to make here. If you select a theme which does not allow much scope in the way of finding stamps, why not go in for two themes? In this way you can, if you wish, ignore subjects such as flowers, ships, etc., in which there are a lot of stamps to be had for the picking up, without losing interest—and you might soon do that if it was only once in a blue moon that you got anything new. You know, this is what often happens when a collector has been very keen on a country for some years, then suddenly tires of it and goes in for something else, simply because he is not coming across a sufficient number of new stamps to keep his interest alive.

There is one important factor I must mention about a thematic collection, and that is the writing-up. You don't want your collection to be all stamps, and no descriptions; nor do you want it all writing-up with only very few stamps. But the writing-up *is* most important, and this is where practice comes in. We British are, in general, atrocious calligraphists, principally because we are too careless to take the trouble to write legibly. Yet, it is only a question of a little practice for one to become quite good at hand printing; so just make that effort at practice before you attempt to write up your collection, and use a suitable type of pen. Make an effort, too, to get your facts right. The local reference library can help you here. Extract the essence of the information. Make up your sentences before you print them on the album leaves, and, if you will only take the job seriously, you will have lots of fun.

Stamp Gossip

NEW COLOURS

RECENTLY a collector sent me two stamps from the Malayan State of Negri Sembilan. They were of the current 10c. value, one deep brown and the other a purple-brown, and both from the same envelope. His query was, how did the difference come about; had something happened to one stamp and not to the other? Yes, something *had* happened, but not accidentally, as all the 10c. current stamps of the various Malayan States are being changed in colour from the brown to the purple-brown as new printings take place. Why the change? Well, I don't think the reason has been announced officially—at least I have not heard of it—but I think it is fairly certain that it was felt that, with the 4c. value being more or less the same colour as the 10c., it was needlessly difficult to distinguish one from the other, so the change was decided upon. Why the defect was not noticed at the start I don't know, but such slip-ups are not uncommon.



A word about the current Malayan stamps in general. As is known, eleven states issue stamps of the same design, the only difference being that each state puts its name, and the head of its ruler on the stamps, with the exception of Negri Sembilan which merely bears the Arms of the territory in place of the portrait. In addition to these stamps there are four values belonging to the federation, all used in common. I understand it is now proposed to bring out high values for the federation, to replace the eleven different sets, so why not look round for nice used copies of the latter while they can be obtained cheaply—as most of them can just now.

OUR OWN COMMEMORATIVES

Now don't forget that on the 28th of this month our Post Office is bringing out a special set of three stamps (2½d., 3d., 1/6d.) to commemorate the centenary of the Post Office Savings Bank. Next month there will be two more special issues. The first, on September 18, will mark the 2nd Anniversary of the European Postal and Telecommunications Conference, with 2d., 4d. and 10d. stamps, and the second, on September 25, will be in honour of the conference of the Commonwealth Parliamentary Association which will begin at Torquay on that date. The values for this issue will be 6d. and 1/6d. Naturally there will be plenty of the 2d. and 3d. stamps, and perhaps the 2½d., 4d. and 6d. will not be too scarce, used, but the 1/3d. and 1/6d., fine used, will take some finding.

So this is my tip: Make a special effort, while the stamps are about, to get as many fine used copies of all the eight as you can, for as time goes on some of them, at least, will prove to be quite scarce—not rarities, of course, but well worth the trouble taken to gather them at the right time.

It will be noted that all the eight stamps which go to make up the three sets are of a different face value, but, of course, that does not mean that they should be lumped together in your album. They will have to be mounted in the three distinct sets which they comprise. See how neatly you can do this.



OTHER COMMEMORATIVES

If three sets in one year is a record for the British Post Office, it is nothing unusual for many foreign administrations. The U.S.A., for instance, put out some-



thing in the region of 40 last year, but this year the number has dropped substantially. When Mr. Kennedy became President, the P.M.G. was also changed, and the new head of the U.S. Postal Services does not seem to be quite as keen about issuing special stamps *ad lib* as was his predecessor; hence the drop. But this does not mean that the U.S.A. is not issuing any fine stamps. Uncle Sam is still obliging collectors with a few nice stamps; stamps which, due to their general high quality and low face value, are popular wherever there are collectors.

AFRICAN "OVERPRINTS"

What a "to do", as they used to say, over South Africa's change of currency. Several other countries—like the three Southern African Protectorates I mentioned last month—also recently changed, and pending new postage stamps in the new rand and cents their existing stamps have been overprinted. It has been quite a task to get the new overprints, especially as there have been variations, with some stamps having three different overprints. I need hardly say that some of the stamps, at least, will prove quite rare, so if any

(*Continued on next page*)

By E. W. Argyle

Locomotives On Stamps



IN 1852, the Vulcan Foundry Ltd., of Newton-le-Willows, Lancashire, exported eight 2–4–0 passenger locomotives to India for the Great Indian Peninsula Railway. These opened the first public railway in India, from Bombay to Thana, on April 16, 1853. The system had a 5 ft. 6 inches gauge. The locomotives were of small dimensions, the cylinders being only 13×20 in. and the coupled wheels 5 ft. diameter. The high, dome-shaped firebox casing and the tender wheels were principal features. One of these engines is shown alongside a 1953 standard "Pacific", with its peculiar "oxygen-cylinder" type of boiler.



A diesel-electric locomotive of the type known as "World" DL-500, built by the American firm of Alco-General Electric, is seen on the stamp above crossing the Despenaperos Gorge. It has a Co-Co wheel arrangement, with an engine horse-power of 1,800, giving a speed of up to 92 m.p.h.

Special 25th ANNIVERSARY OFFER to readers of MECCANO MAGAZINE

complete STAMP COLLECTOR'S OUTFIT

Free



To celebrate our 25th birthday as Britain's Leading Stamp Company, we offer a Beginner's Stamp Collector's outfit absolutely FREE. This outfit worth as least 5/–, contains everything to start you off on the World's Finest Hobby! This is what it includes:

1. Flying Squad Stamp Album with 120 illustrations, to hold 1,550 stamps.
2. Magnifier to check stamps for flaws, etc.
3. Stamp Wallet for "swaps" etc.
4. Perforation Gauge to measure perforations.
5. Black metal Watermark Detector Tray—and a Leaflet explaining how to use items 4 and 5.
6. Metal Tweezers for handling stamps properly.
7. 16-page XLCR Stamp Finder Book, to enable you to identify stamps easily.
8. Land Finder World Map.
9. Packet of 100 Stamp Hinges.
10. Exact full colour facsimile of World's Rarest Stamp. (Original worth £35,000!)
11. "How to organise a Stamp Club." Leaflet.
12. Super Stamp Club Badge, in red, white and blue, to wear on your lapel.
13. Catalogue and Price List of Albums, Packets of Stamps and Accessories.
14. Two special "Prize Stamps", valued at 2/9d. in 1960 Catalogue.
15. Special collection of 55 **ALL DIFFERENT STAMPS** to start you off on this grand hobby.

These items will be sent absolutely FREE if you fill in the coupon below and post it to us, enclosing only 7½d. in stamps for our postage. We will also send you a selection of our famous Special Approvals—priced stamps which you can buy if you wish, or return if you don't wish to buy them. (No need to buy anything!) Please tell your parents you are sending for this FREE Outfit and Approvals.

To PHILATELIC SERVICES
(Dept. MM1). Eastrington, Goole, Yorks.
Please rush me the Free Stamp Collector's Outfit described above, and your Special Approvals for inspection. I enclose 7½d. in stamps for postage.

Name.....

Address.....

.....MM1

How about your friends? Owing to the value of this Offer, it is limited to one Outfit per applicant. But many of your friends will want to send for this Offer, so write their names and addresses on a piece of paper, enclose 7½d. for each and we will gladly send the Outfit and Approvals to them. No need for them to use the Coupon.

"MAN IN SPACE" PACKET FREE

Magnificent Packet containing the above topical and most recent issues from **Russia** and **Czechoslovakia:** 1961 Space Rockets from **Czechoslovakia;** Two Large Multicoloured Birds from **Poland;** Bi-coloured 1961 Pictorial from **Dahomey; Maldives** (1961 Coconut) etc., etc. **15** Fine Attractive New and Recent issues **Absolutely Free** to all applicants for my Popular "Marvel" Approvals, enclosing 3d. towards cost of postage. SEND TODAY and tell your parents.

W. GRANVILLE LUCAS (FF), Hinckley, Leics.

FREE—STAMPS CATALOGUED 5/–
to applicants for ½d. approvals. (*Letters only*)
COX, CUDDINGTON CROFT, EWELL RD., CHEAM

FOR OTHER STAMP ADVERTISEMENTS SEE ALSO PAGE 302

Stamp Gossip—

(*Continued from previous page*)

readers have contacts with Basutoland, Bechuanaland and Swaziland, and can get any used copies of the stamps in question, they should take care to obtain them. One stamp—the first overprint on the Bechuanaland 10/—was offered, used, recently at £50. It is said that fewer than 2,000 were surcharged. On this stamp the type is smaller than is normal, but £50 for a 10/– stamp is an awful lot to pay, at least for one issued so recently.

GEORGE CROSS ISLAND

As everybody knows, Malta was awarded the George Cross for its bravery and steadfastness during World War II. Every year since then it has issued a set of stamps to mark the passing anniversaries. This year's set is particularly attractive, and as it was on sale for only one month the stamps are getting scarce. Not only does this apply to this issue, but stamps of those which preceded it are getting harder to find. So collectors who already have copies of their "QEII" collections, bought when the stamps were current, cannot grumble at prices today. There is one point about this year's set, which was withdrawn on May 15—as a printing job they are really first class. Harrison & Sons are the printers, and they receive orders from all over the world.



RABINDRANATH TAGORE

Older readers at least will remember the impact which this Indian poet made on the West some years ago. I am afraid his reputation is not as high as it was, but there are always reactions, for —to put it crudely—that which goes up must come down. But reputations, unlike rockets, have a habit of rising again, and once more a growing number are rating Tagore higher than was the case a year or two ago.

Mr. Kooka, of Bombay, has kindly sent me first day covers, and mint copies, of the stamp which India has issued in honour of her famous and gifted son. As usual with Indian stamps, it is quite attractive, as can be seen from the illustration here.

THE TIP OF THE MONTH

Short and sweet this time, and a repeat of what I said earlier in these Notes. Go after used copies of the special commemorative stamps which our Post Office is issuing this year. At least they will make fine swops.

NEW ROAD SURFACES: AN R.A.C. PLEA

The R.A.C. ask motorists to slow down when driving over newly-surfaced roads. With roadwork taking place all over the country, there is a very real danger to traffic from flying stones thrown up by fast-moving vehicles.

Biggest hazard is to windscreens; R.A.C. Patrols have reported as many as fifteen broken in one day. By slowing down, the motorist reduces the danger to following cars and minimises the risk of stones, or splashes of tar and bitumen, damaging the paintwork of his own vehicle. Damage to the road surface itself is also prevented.

Resurfacing is in the interests of every road user and, in general, adds the R.A.C., local authorities do their best to minimise the risk of flying chips by following the recommendations of the Road Research Laboratory as to the type and size of stone to be used.

Power from Niagara—

(*Continued from page 270*)

is experienced, water is released; thus the same water flows back through the pumps which, this time, act as generators.

The signing of the Niagara Diversion Treaty was also the signal for the United States to begin construction of a huge generating station of their own on the opposite side of the river. However, political considerations delayed the start of the project, with the result that the Canadian station was completed and in operation while the American plant was still under construction. The U.S. project is almost a twin to that of the Canadian and makes use of giant conduits which take the water beneath the town on the American side of Niagara Falls.

The Niagara River and the surrounding countryside have, in past centuries, been the scene of many violent battles between British and American armies. But those days have gone for ever, and Canadian-U.S. co-operation is now exemplified by the power stations which face each other across the river, each producing power to make life easier for people for hundreds of miles around. The Niagara generating stations are made all the more useful because they are linked to the power plants forming part of the St. Lawrence Seaway.

Of all the hydro-electric power plants in the Western world, those at Niagara produce more than any other. In combination, their output far exceeds that of the Grand Coulee project on the Columbia River, once the greatest in the world.

The Golden Age of Whaling—

(*Continued from page 276*)

above the docks and bowsprits thrust out over the cobbles, you read the romance of these graceful ships in their brightly-painted names.

Here is the last resting place of the square-rigged *Joseph Conrad*, veteran of a dozen voyages round the Horn. The schooner *Australia* rides at her final berth, with many dark memories of running illegal cargoes of New Guinea kanakas bound for work as near-slaves on Queensland sugar plantations.

Here, the *Regina M.*, last of the New England pinkeys—small sailing vessels with narrow sterns—was completely rebuilt on the slipway, and nearby is the only surviving side-wheel ferryboat, the *Brinkerhoff*.

This unique community of the past stands as an authentic monument to a bygone age when New England seamen went a-roving to the ends of the earth in search of the great sperm whale.

Flight Test Centre—

(*Continued from page 273*)

made, perhaps to the ignition or fuel flow systems, before the engine is released for service. This is only one of a vast number of features of the engine that must be proved in flights from Patchway. A modern engine may well be expected to operate faultlessly at any height from sea level to 60,000 feet in temperatures ranging from 40 degrees C. to minus 80 degrees C., and in air pressure varying from 15 lb. per square inch to 1 lb. per square inch.

The kind of overall performance demanded from a present-day turbo-jet would be considered impossible to achieve in any other form of transportation, but it *is* achieved in the air—and with a tremendously long overhaul life in many cases.

Only after a visit to a flight test centre like Patchway does one realise how much safe, efficient flying depends on the men whose daily work may entail fitting "black boxes" in an unending stream of aeroplanes, analysing countless sheets of data, climbing and descending monotonously for hours at 38,000–40,000 feet, or feeling the occasional tense exhilaration of controlling a strike fighter as it flashes a few feet above the sea, in bumpy air, at around the speed of sound.

Road and Track—

(*Continued from page 275*)

and 0–70 in eighteen seconds, while remaining smooth and docile enough to pull from 20 to 40 in top gear in just under nine seconds.

The proud possessor of a chassis frame, the Alvis is no lightweight at 31 cwt., and it is creditable indeed that the acceleration figure from rest to 90 m.p.h. is 38 seconds and that the top speed is in the region of 105 m.p.h. The stopping power of the braking system—servo assisted Lockheed discs at the front and drum brakes at the rear—is equally impressive.

The interior of the Alvis, its body styled by the Swiss coachbuilder Graber, is not only luxurious, with real leather, pile carpets and polished wood fascia, but highly functional as well. The two bucket front seats are extremely comfortable, the stubby remote control gear lever falls easily to hand and operates a smooth four-speed box, while the long, low bonnet gives a first class view and a commanding driving position.

This is one of the few remaining motor-cars in a world of mass-produced cars with a personality of its own. At £2,827.7s.6d. it provides relaxed, safe and comfortable high speed travel that, once experienced, is never forgotten. I wish I could afford one.

Mike Parkes—

(*Continued from page 275*)

Ferrari for twelve of the twenty-four hours, sharing the driving with W. Mairesse and finishing second to Phil Hill and Gendebien.

As a Design and Project Engineer with the Rootes Group, he has been working for the last five years on a new small car which keeps him so busy that he cannot afford the time to compete in Formula 1 this year. Nevertheless, we shall see a great deal of this up-and-coming driver in the dark blue cars of Equipe Endeavour and the Formula Junior Gemini.

Meccano Goes to Moscow—

(*Continued from page 277*)

It is hoped that in the future a considerable volume of Meccano goods and other British toys will flow into Russia, but if outside reasons should prevent the full commercial development which would satisfy the Russian demand, some satisfaction at least will be felt in the fact that an improved understanding, and better human relations, will certainly result from this adventure in faraway places.

Photographers' Page—

(*Continued from page 287*)

Moving trains can be photographed by one or other of the methods discussed last month. Even if you do have a camera with a fast shutter speed, trains nearly always make the best pictures when they are moving fairly slowly, toiling up a steep gradient, for instance, or slowing on a sharp curve. Again an almost head-on, or slightly side-angled, view makes an attractive picture and enables you to "stop" movement as much as possible.

I do want to stress most particularly that there is no need whatsoever to trespass on railway property to get good train pictures. In these days of silent, extremely fast diesel and electric trains it is more dangerous than ever to go on the railway line; moreover, it is unnecessary. Whatever your ambitions in the way of railway photography may be, safety, both in regard to yourself and others, is of paramount importance.

There are innumerable lineside vantage points from which to take train pictures, and the enthusiast will seek them out in his own neighbourhood. A good map of your area, such as an Ordnance Survey map, will show you where the railway comes close to the road, and the location of suitable foot and road bridges.

Really excellent pictures are possible from bridges over the line, but don't be tempted to climb up on to the parapet—it just is not safe—and anyway such a location makes it quite impossible to hold your camera firmly and steadily. *Pictures are not worth risks.*

The Jaguar—(*Continued from page 286*)

between the XK and the Mark VII.

In October 1955 this need was met by the introduction of the 2.4 litre model which was smaller than the Mark VII, but still unmistakably Jaguar. A 3.4 litre version was made in January 1957 and, in October 1959, the series was completed with a 3.8 litre model. With slight modification, this range is being continued, demand still exceeding supply in spite of doubled output.

The 3.4 litre Mark 2 Jaguar—to quote its full title—has a six-cylinder twin overhead-camshaft engine developing 220 b.h.p. at 5,500 revs. Disc brakes are fitted as standard and the car can be supplied with Borg Warner automatic transmission. Maximum speed is in the region of 120 m.p.h., yet the price is remarkably low—£1,669 in standard trim. There is a replica of this Jaguar in the Dinky Toys series.

Fireside Fun



"This isn't the job for a man of his calibre."

Waiter (to impatient diner): If you have the patience to wait another couple of minutes, I'll be able to stop ignoring you.

* * * *

Some people are bent with toil. Others become crooked trying to avoid it.

* * * *

A business man called at his bank and asked to see the manager. "Are you worried about whether I can meet my cheque?", he asked.

"Well, now that you mention it," replied the banker . . . "yes, I am worried."

"Fine," said the client. "That's what I'm paying you 6 per cent. for."



A U.S. Congressman making a tour of the Far East ran into a correspondent in Tokyo who suggested dinner at the most expensive place in town. At the end of the meal, the correspondent summoned the waiter and, struggling over every syllable, spoke a few words in Japanese.

"Is that all the Japanese you have learned in seven months?", joked the Congressman.

"It's enough" the correspondent assured him. "I told him to give you the bill."

* * * *

The major looked up from his desk at the private and snapped, "Now really, I ask you, in civilian life would you come to me with a puny complaint like this?"

"No, sir," was the reply, "I'd send for you."

* * * *

Two women who were manœuvring their car into a tight parking space gave up after a valiant struggle. The driver shut off the motor and said to her companion, "This is close enough. We can walk to the curb from here."

* * * *

Jones: I'm worried—it's raining and my wife is downtown.

Brown: Oh, she'll probably step inside some shop.

Jones: That's just what I'm worried about.

* * * *

Shop sign in Japan: Haircut while you wait.

Policeman to a pedestrian struck by a hit-and-run driver, "Did you get his licence number?"

Victim: No, but I'd recognise his laugh anywhere!

* * * *

Soldier: I can remember when I was in the Army out on patrol, 200 Arabs attacked us. We hadn't any ammunition, and we were in a tight spot, but I made them run.

Friend: How did you do that?

Soldier: Oh! it was simple, I just ran and they followed!

* * * *

A schoolmaster saw that one of his pupils had given an incorrect answer to an important question in a test. Test paper in hand he approached the boy sitting at his desk. Courteously rising, the boy explained, "I told Dad it would be wrong, but he just wouldn't listen to me."

* * * *

The mother of a five-year-old girl, being short of small change one day, borrowed a few coins from the kiddy's piggy bank.

Later in the day there was a wail from the child's room. Her mother looked in to find the little girl seated at her desk, her coins spread in a straight row in front of her.

"Somebody's taken some of my money," she sobbed. "It doesn't reach as far as it did."



"How did I know they would GROW in the night!"

BOOKS
from Ian Allan

RECENT NEW TITLES

abc BRITISH RAILWAYS LOCOMOTIVES

Pts. 1/2 Western Region and Southern Region.	2/6
Pt. 3 Midland Region.	2/6
Pt. 4 Eastern Region.	2/6
Pt. 5 Diesel and Electric.	2/6
Pt. 6 Diesel Multiple Units.	2/6
Pt. 7 Electric Multiple Units.	2/6
COMBINED VOLUME	**10/6**

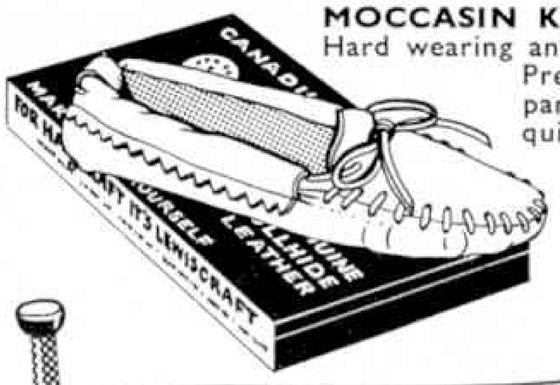
LOCOMOTIVE SHED DIRECTORY

Giving details and location of locomotive sheds in Great Britain. 3/6

abc B.R. HEADCODES	**2/6**
abc LOCOSHED BOOK	**2/6**
abc MINIATURE RAILWAYS	**2/6**
abc NARROW GAUGE RAILWAYS	**3/6**
abc CIVIL AIRCRAFT RECOGNITION	**2/6**
abc ROYAL AIR FORCE	**2/6**
abc MOTOR RACING	**2/6**
abc BUS FLEETS—7 Midland	**2/6**
abc BUS FLEETS—8 West of England	**2/6**
RAILWAY COLOUR ALBUM	**4/6**
IAN ALLAN BOOK OF RAILWAYS	**6/6**
LOCOSPOTTERS' ANNUAL 1962	**7/6**

From bookshops or the publishers

Ian Allan Ltd
HAMPTON COURT · SURREY



MOCCASIN KIT (CANADIAN)
Hard wearing and easy to make up. Prepared bull hide parts. No tools required. Full instructions. Sizes 2–9, Price **29/6.** *Post & Pkg. 1/6.* Sizes 10–12, Price **32/6.** *Post & Pkg. 1/6.*



BINOCULARS (FOREIGN)
Focusing binoculars, with built in compass in strong carrying case. Price **39/11.** *Post & Pkg. 1/9.*

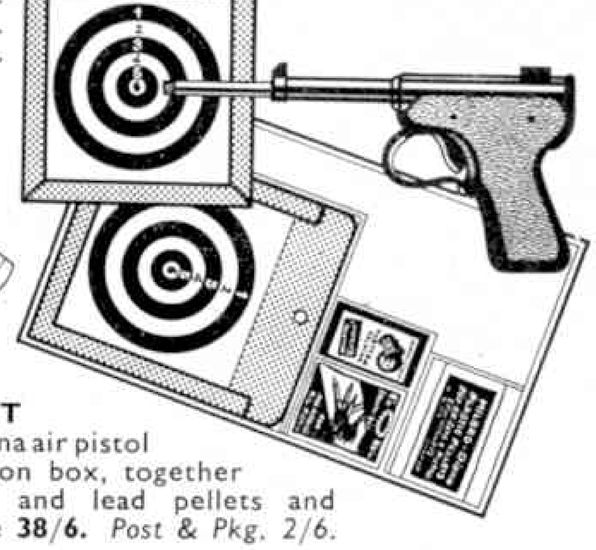
Hamleys
Estd. 1760
HAMLEY·BROTHERS·LTD
The Finest Toyshop in the World
200-202 REGENT STREET LONDON W.1.
*Our Only Address



KNIFE AND HATCHET SET
A Sheffield steel sheath knife (5 in. blade) and hatchet in a safe sheath for attaching to belt. Price **35/11.** *Post & Pkg. 2/–.*



LINK BELT KIT (CANADIAN). Leather prepared links, tongue and buckle for making your own link belt with instructions. Price **9/11.** *Post & Pkg. 10d.*



AIR PISTOL SET
Accurate Diana air pistol in presentation box, together with plastic and lead pellets and target. Price **38/6.** *Post & Pkg. 2/6.*

ADD THAT FINAL TOUCH OF DETAIL TO YOUR
KITMASTER COACHES
WITH:-
PECO INTERIORS

Printed in full colour on quality card, with windows already cut. They include passengers, magazines and luggage. Simple assembly, with detailed instructions.

MODIFIED SLIGHTLY, THESE INTERIOR KITS CAN ALSO BE USED WITH OTHER COACHES.

KITS AVAILABLE NOW:

No. 13	COMPOSITE
No. 14 K	COMPARTMENT 2nd
No. 14 SO	OPEN SECOND
No. 15	BRAKE SECOND

THE PRITCHARD PATENT PRODUCT CO. LTD.
PECOWAY, STATION ROAD, SEATON, DEVON

"GLOBE-KING"
WORLD-FAMOUS KITS AND RECEIVERS

Designed and marketed specially for the newcomer and beginner, the "Globe-King" kits continue to enjoy world-wide popularity. Unsolicited Testimonials include many from Transmitting Amateurs and Professional Operators praising performance and efficiency of this miniature equipment. The single-valve kit costs **only 79s. 6d.** complete down to the last screw. First-class components throughout, three coils, three low-loss S.W. variables includes band-spreading, Siemens-Ediswan Mazda valve, etc., Unit-assembly and construction. "Easy-Build" Diagrammatic Instructions enclosed with each Kit. Send now for Catalogue—it's free, but please enclose stamps for postage.

JOHNSONS (Radio)
ST. MARTINS GATE, WORCESTER

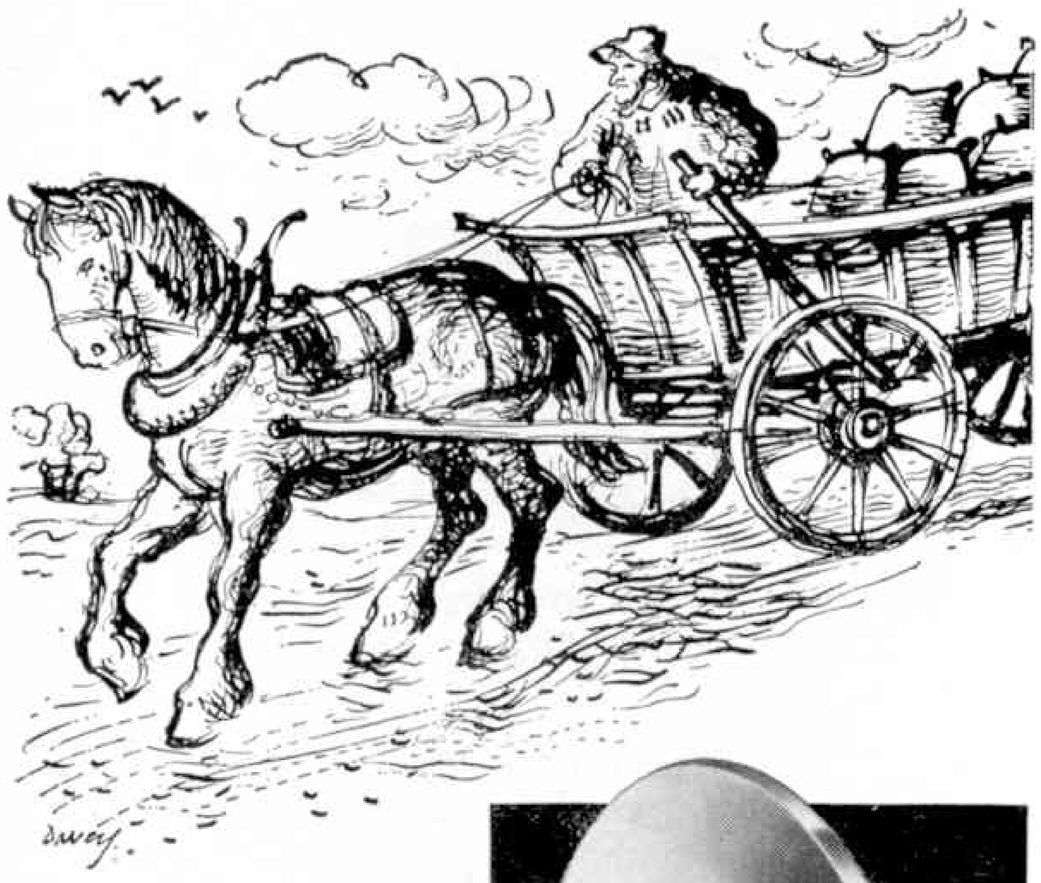
CHEMISTRY APPARATUS

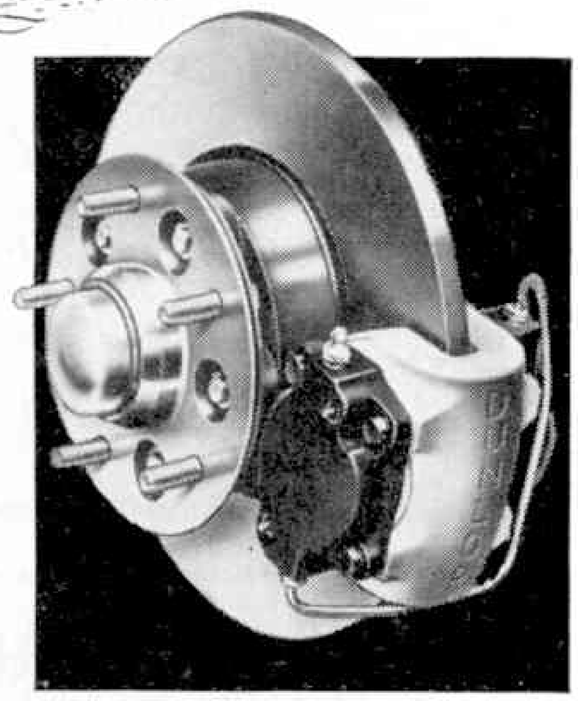


Send 4d. stamp for
LATEST
PRICE LIST

Booklets:
'EXPERIMENTS' 1/3
'FORMULÆ' 1/3
'HOME CHEMISTRY' new edition 2/11
(Post Free)

BECK (SCIENTIFIC DEPT. G), 60 High St., STOKE NEWINGTON, LONDON N.16





HOW TIMES HAVE CHANGED

The expression "putting a spoke in the wheel" was used quite literally in the days before mechanical brakes. The carter used to push a rod between the spokes of his cart wheel to slow his progress downhill. Later, braking was simplified by placing a drag-shoe under the wheel.

All kinds of mechanical brakes have been developed since then, and in 1945 Dunlop introduced a Disc Brake. Operating by friction pads closing on a metal plate, it gives much greater "power to stop." Dunlop Disc Brakes are found today on aircraft, buses, trucks, racing cars and on the most advanced private motor cars.

DUNLOP

SYMBOL OF PROGRESS

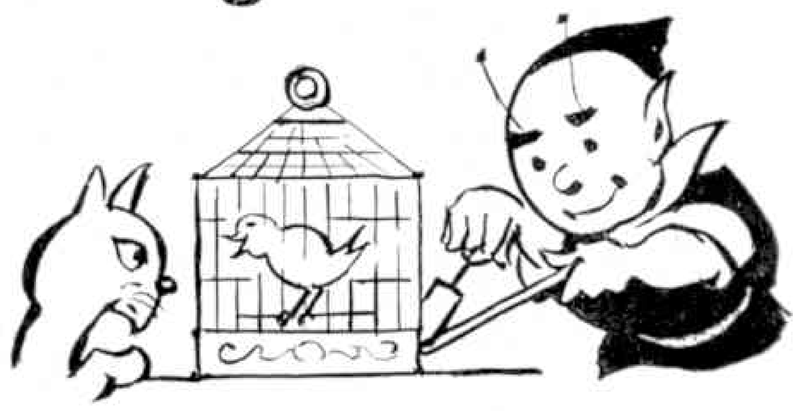
CFH/PRI/2

Whether you solder to

(*a*) **keep things IN .....**



(*b*) **keep things OUT .....**



(*c*) **keep things GOING.....**



success is certain with

FLUXITE

You can't go wrong with FLUXITE. Every engineer and mechanic confronted with a soldering job knows FLUXITE is the flux that never lets him down. FLUXITE's great popularity is proof positive of its qualities.

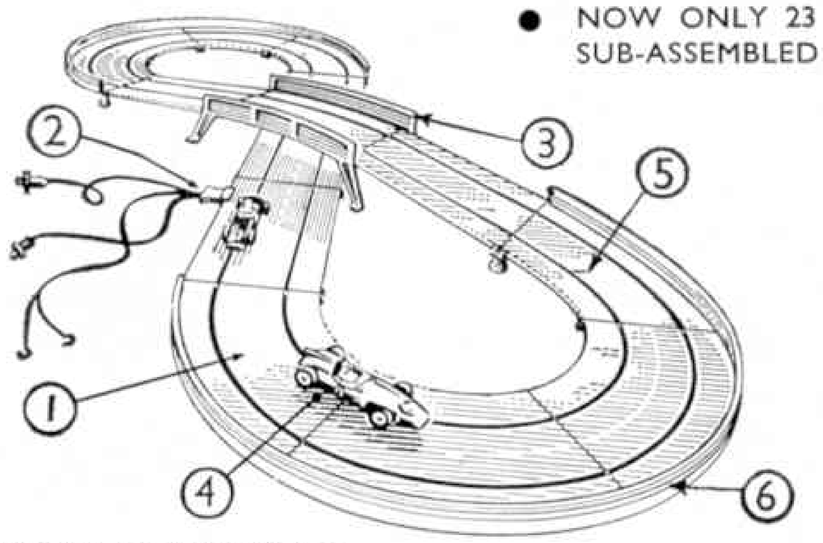


M.P.90

Obtainable from all good-class Ironmongers & Hardware Stores

REVOLUTION IN SLOT-TRACK RACING

NEW VIP RACEWAYS



- NOW ONLY 23 QUICK-LOCK SUB-ASSEMBLED COMPONENTS

COMPARE THESE FEATURES:

1 — Quick-lock track units for instant assembly.
2 — Pre-assembled wiring—plug in and start racing.
3 — Realistic rigid bridge.
4 — Racing Cars *with front wheel steering*—essential for good performance.
5 — Roadway colour printed for realism.
6 — Quick-fit resilient one-piece crash barriers.
7 — V.I.P. Quality for continuous running without overheating.

Full range of trackside accessories

Made and Distributed by

VICTORY INDUSTRIES LIMITED

Dept. M., Barfax Works, Guildford, England. *Telephone:* Guildford 5276

Experiments for Young Scientists



A new book by
DON HERBERT

Serious yet exciting experiments, with easily-obtainable materials, in chemistry, physics, biology and borderline subjects like biochemistry. A first-rate practical book. *Illustrated.* 15s.

ORDER IT FROM ANY BOOKSHOP.

Published by **G. Bell & Sons**

BACK ISSUES AVAILABLE!

Meccano Magazine
Before 1942 .. **1**/– each
(Complete years **12**/–)
1942–1955 .. **9d.** ,,
(Complete years **8**/–)
1956–1960 .. **1**/– ,,
(Complete years **10**/–)

Railway Magazines
1942–1949 .. **2**/– ,,
(Complete years **10**/–)
1950–1961 .. **1/6** ,,
(Complete years **15**/–)

Trains Illustrated
1953–1955 .. **1/6** ,,
1956–1961 .. **2**/– ,,

Buses Illustrated
1958–1961 .. **2/6** each

Model Railway News or
Model Railway Constructor
All issues to 1960 **9d.** each

Railway Modeller
1950–1956 .. **1/6** ,,
1957–1961 .. **2**/– ,,

Cigarette Cards
100 Mixed .. **2**/– ,,

LENS of SUTTON,
50 CARSHALTON RD.,
SUTTON, SURREY

Postage extra on all items please

HEAR ALL CONTINENTS

With H.A.C. SHORT-WAVE RECEIVERS

Noted for over 18 years for . . .
S.W. Receivers and Kits of Quality.

Improved design with Denco coils:
One Valve Kit, Model "C".....**Price 25**/–
Two-Valve Kit, Model "E".....**Price 50**/–

All kits complete with all main components and full instructions. (Valves extra if required, 8/– each.) Before ordering call and inspect a demonstration receiver, or send stamped, addressed envelope for descriptive catalogue.

"H.A.C." SHORT-WAVE PRODUCTS
(Dept. M.M.), 44 Old Bond Street, London W.1

BOOKS:		
60 Plans for Small Layouts		**2/6**
RAILWAY ACCESSORIES:	00	0
Train Crew (3 figures)	**1/9**	—
New Coal Depot	**6**/–	—
G.W.R. Lower Quadrant, Home or Distant Signals	**5/10**	**12/6**
Green Lichen (per bag)	**1/6**	**1/6**
Airfix Saddle Tank Kit	**3/6**	—
A-CEM Stone Walls, 6½ in.	**1/2**	**1/2**
A-CEM Stone double line Tunnel Mouth	**6/5**	—
Cork Track Underlay 36 in. × 12 in. ..	**1/6**	**1/6**
Working Corridor Connections, pair ..	**2**/–	**4/6**
Scale Bicycles	—	**1**/–

"00", "TT" or "0" Railway and Book Lists, each **6d.**
POSTAGE EXTRA

TYLDESLEY & HOLBROOK (M.E.T.A.)
109 DEANSGATE, MANCHESTER 3

P.B.K. CANOES

Plans, Materials and Accessories, etc.

G. G. HINTON (6), Abbey Fleet, Lechlade, Glos, S.A.E.

Be a 'Meteor' marksman!



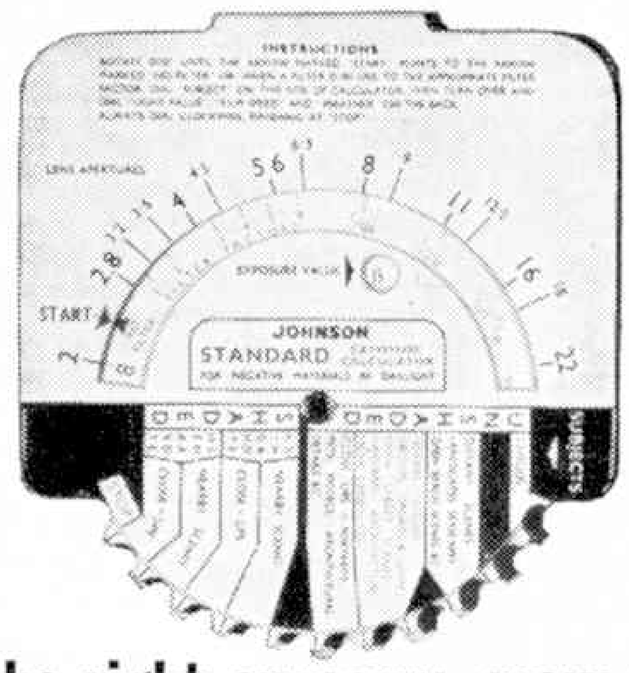
Air Rifle shooting is great fun! And on the B.S.A. Meteor you have a telescopic sight for super accurate aiming. Supplied with a complete kit—pellets, target, target-holder and lubricant —the B.S.A. Meteor is made with traditional B.S.A. quality in every part.

Write today for coloured literature on the Meteor, and the free B.S.A. booklet, 'The Air Rifle'. You'll see how you can learn to shoot with safety.

Meteor
AIR RIFLE
shoot with SAFETY

B.S.A. GUNS LIMITED, SHIRLEY, SOLIHULL, WARWICKSHIRE

PHOTOGRAPHERS!



Get the right exposure every time!

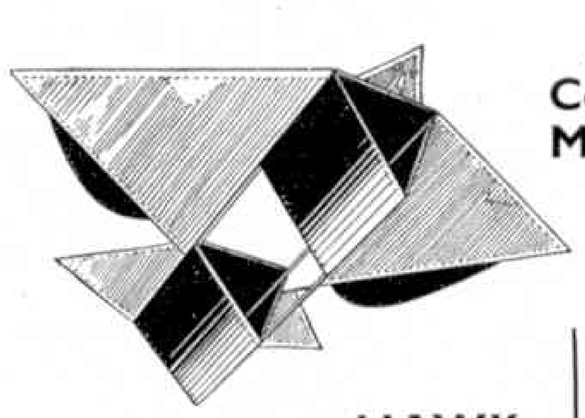
Do your pictures ever come out over-exposed or under-exposed? You need a Johnson Standard Daylight Exposure Calculator! It's only 4/6d. With this calculator, you just 'dial' for the correct exposure. It's easy! You 'dial' the sort of subject you are photographing, the light conditions, the weather, and the speed of the film you are using—then read off the exposure details. Other calculators for colour cine, artificial light, and flash are also available. Ask your local photographic shop about Johnson calculators.

JOHNSONS
OF HENDON LTD

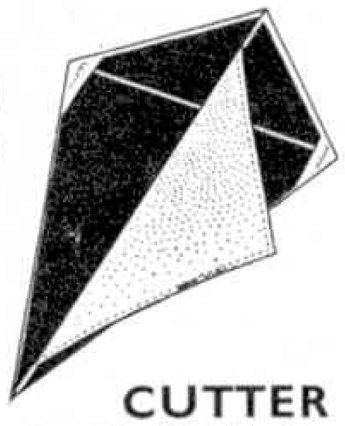
GAMAGES

STRONG KITES

For Real Outdoor Thrills . . .



All in Colourful Materials



HAWK
The wings flap like a bird in flight.
20 in. high.
34 in. wide.
14/-

CUTTER
Brightly coloured. Suitable for persons of all ages.
34 in. high.
26 in. wide.
7/3

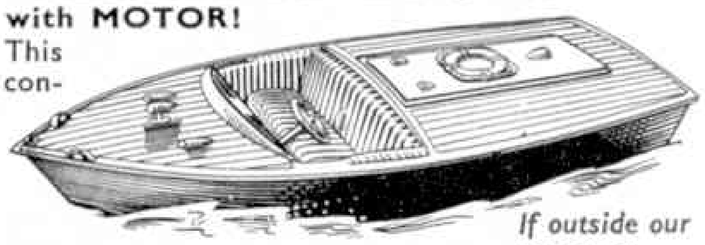
Post & Pkg. 1/9 all kites, if outside our van area.

THE BOAT KIT YOU CAN SAIL!

'Playcraft' TERRAPIN LAUNCH

Complete with MOTOR!

The kit with a difference. This partly built model is easy to construct and is ideal for the beginner. Supplied complete with an electric motor, it can be sailed on a pond when completed. Coloured plastic construction, requires no painting.

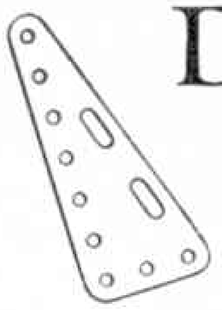


GAMAGES PRICE **26/11**

If outside our van area, Post & Pkg. 1/6

Comprehensive range of Meccano parts in stock. Official Dealers.

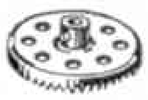
GAMAGES, HOLBORN, LONDON E.C.1 HOLborn 8484



DEALERS WHO SPECIALISE IN MECCANO SPARE PARTS



Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who are constantly requiring additional spare parts for their Sets. All dealers are, of course, able to order Meccano spare parts for their customers, but those listed below are among our spare part specialists.





H. J. BANKS
23 St. Peter's Street
BEDFORD, Beds.
Telephone: 61183







ALFREDS & WARNER LTD.
5 and 6 Grand Hotel Buildings
Barras Bridge, Newcastle-on-Tyne 1
Telephone: 2-4987

BATESON'S SPORTS DEPOT LTD.
2 Abingdon Street
BLACKPOOL
Telephone: 24061

FLETCHERS (Sports) LTD.
20-24 Kings Square
GLOUCESTER
Telephone: 22974

WILLMOTT'S STORES LTD.
45-51 Prince of Wales Road
NORWICH
Telephone: 23101

TETTS THE IRONMONGERS
402 Wimborne Road
Winton, BOURNEMOUTH
Telephone: Winton 309

THE GUILDFORD
DOLLS' HOSPITAL LTD.
13 Swan Lane, GUILDFORD
Telephone: 61331

F. T. B. LAWSON LTD.
New George Street
City Centre, PLYMOUTH
Telephone: 65373/4

H. SALANSON & CO. LTD.
83-85 Fairfax Street
BRISTOL 1
Telephone: 2-6185

E. F. WILLIAMSON & SON LTD.
11 Belgrave Gate
LEICESTER
Telephone: 58525

RICHARD MARSDEN & SON LTD.
115 Church Street
PRESTON
Telephone: 3314

R. M. HILL & SONS
36/40 Castle Street
CARLISLE
Telephone: 21621 and 21122

LUCAS'S (Hobbies) LTD.
7 Tarleton Street
LIVERPOOL 1
Telephone: Royal 7562

THOMAS MEARS LTD.
14 and 15 Fishgate
PRESTON
Telephone: 5219

W. PAINE & CO. LTD.
168 High Street
CHATHAM. Also at Strood and Grays
Telephone: 45215

H. A. BLUNT & SONS LTD.
133 The Broadway, Mill Hill
LONDON N.W.7
Telephone: Mill Hill 2877

LANE'S TOY SHOP
75 High Street
ROCHESTER
Telephone: Chatham 41870

POPE & SMITH LTD.
20/21 Tindal Street
CHELMSFORD
Telephone: 2331

JEREMY
16 Princes Arcade, Piccadilly
LONDON S.W.1
Telephone: Regent 1846

BOSWORTH & CARVELL LTD.
Bank Street (opp. Century Cinema)
RUGBY
Telephone: 5275/6

KENT, BLAXILL & CO. LTD.
3 High Street
COLCHESTER
Telephone: 6371

SCRASE
234 Battersea Park Road
LONDON S.W.11
Telephone: Mac 1844

WILTONS SPORTS & GAMES
Corner Canal and Queen Street
SALISBURY
Telephone: 2984

HARVEYS OF COVENTRY LTD.
16 Broadgate
COVENTRY
Telephone: 26570

WAIN'S, THE TRAIN SHOP
478 Kingsland Road
DALSTON, LONDON E.8
Telephone: Clissold 8186

OSBORN & CO. (Southampton) LTD.
9 High Street
SOUTHAMPTON
Telephone: 23617

DOLLS' HOSPITAL (MELLERS)
55 Hallgate
DONCASTER
Telephone: 2831

H. WILES (Retail) LTD.
124 Market Street
MANCHESTER 1
Telephone: Central 5161-2-3

LESLIE BROWN
Super Toy and Model Store
95 High Street, Stockton-on-Tees
Telephone: 67616

DERRETT (Toys) LTD.
52 High Street
ERITH, Kent
Telephone: 32339

BOYDELL'S
Percy Street
NEWCASTLE-ON-TYNE 1
Telephone: 24281

H. G. CRAMER LTD.
172a-172b High Street
WATFORD
Telephone: 23522

BOND'S

Special offer of super detail plastic aeroplane kits. Attention is drawn to the 1914-18 series which show a step in the development of fighter aircraft.

	each
½" scale Boeing P-26A	6/6
½" scale Lockheed F-90	6/6
½" scale V.R. Convair (Vertical Riser) ..	5/9

1/48th SCALE 1914-1918 AIRCRAFT

Avro 504K .. .. ..
SE.5A Scout .. .. ..
Fokker D7 .. .. ..
French Nieuport .. ..
} Price **5/9** each

Packing and Postage 1/3 extra per kit.

AMERICAN BALSA WOOD WATERLINE SHIP MODEL KITS

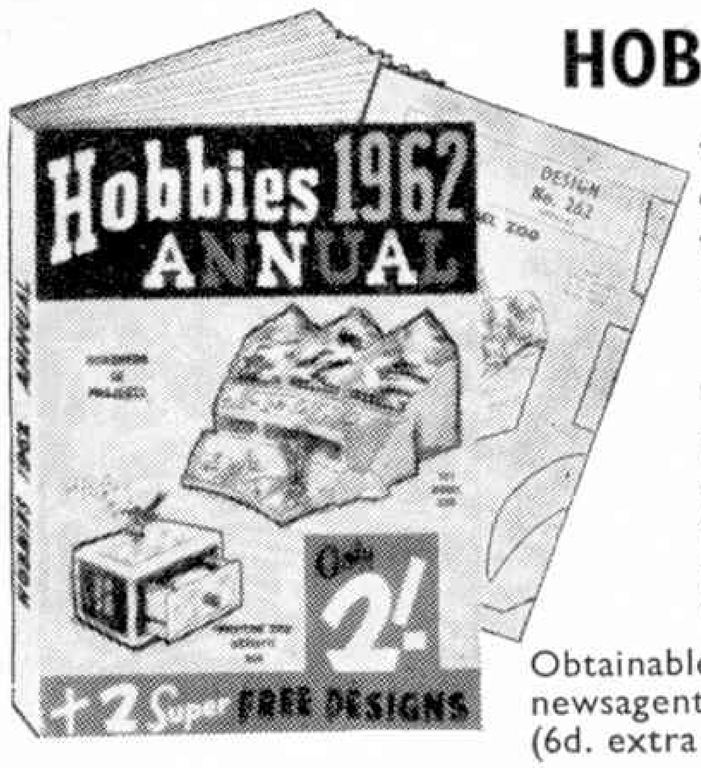
These kits make up into super detail models approximately 16" long.

U.S.N. LST 608 .. ..
U.S.N. Destroyer .. ..
U.S.N. Cruiser .. ..
U.S.N. Battleship .. ..
} Price **7/6** per kit

Packing and postage 1/6 extra per kit.

Bond's Model Catalogue .. .. Price **2/–**

BOND'S O' EUSTON ROAD LTD.
357 EUSTON ROAD, LONDON N.W.1
Est. 1887 *Phone:* EUSton 5441-2



HOBBIES 1962 ANNUAL

180 pages packed with hundreds of exciting projects and interesting information for the handyman, hobbyist, modeller and home craftsman.

GIVEN FREE WITH EACH COPY

Large designs for making a sensational novelty — the "WHISTLING BIRD" Cigarette Box, and a grand TOY MODEL ZOO. Each worth the price of the Annual.

Obtainable now from Hobbies branches, stockists, newsagents, bookstalls, etc. or by post direct (6d. extra for postage).

There's always a big demand. Make sure of your copy NOW.

STILL ONLY **2/–**

Your friends overseas would welcome a copy.

To HOBBIES LTD.
(Dept. 96), Dereham, Norfolk

Please send.....copy/copies Hobbies 1962 Annual containing two free plans.

NAME.....

ADDRESS.....

.....

.....

P.O. for.....enclosed.

NEW MICROMODEL

"Lineside" Disused Coach "00" gauge Cut-Out, Two colour. Price including Purchase Tax **6d.**, plus 3d. postage.

MOTOR CRUISER

now in reprint

Build into reproduction a Thorneycroft cruiser. A few drops of methylated spirit are sufficient to run this model for half an hour or more. Full instructions with each pack. Per pack including Purchase Tax **1/–**, plus 3d. postage.

MODELCRAFT LTD.
77 Grosvenor Road, London S.W.1

WORLD WIDE RADIO RECEPTION

FOR THE AMATEUR RADIO ENTHUSIAST
TUNE IN WITH THE
MALVYN SINGLE VALVE SHORT WAVE COMMUNICATIONS RECEIVER

All-Dry Battery operated: Extremely low running costs: Band Spread Tuning: Attractive Front Panel: Full Operating instructions included.

PRICE OF COMPLETE RECEIVER **74/6** (Batteries and Phones Extra). Post Free U.K. Money Back Guarantee. Send S.A.E. to actual Manufacturers for Free Descriptive Literature.

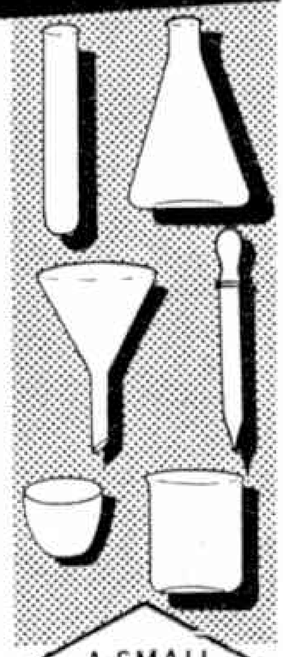
MALVYN ENGINEERING WORKS
Radio and Electronic Engineers
Tel.: Hertford 2264. **7 Currie Street, HERTFORD**

G.C.E

Wolsey Hall (est. in 1894) can prepare you *successfully* by post for all G.C.E. examinations; Lond. Univ. Degrees, and many other exams. Moderate fees, instalments. 22,000 successes since 1944. Prospectus (mention exam.), from E. W. Shaw Fletcher, C.B.E., LL.B., Dept. GK51.

WOLSEY HALL, OXFORD

LOTT'S *Chemistry*



Why not convert your existing chemistry set into a real student's laboratory by easy stages.

Supplies of spare apparatus and chemicals are always available from dealers everywhere.

Ask to see Lott's Stone Puzzle together with the interesting book containing 150 problems.

Ask to see them at your dealer or write to the manufacturers for current price list, enclosing 2d. stamped addressed envelope.

A SMALL SELECTION FROM OUR LIST

LOTT'S BRICKS LTD
Dept. MC.4 · WATFORD · HERTS.

City of Cardiff Education Committee

REARDON SMITH NAUTICAL COLLEGE, FAIRWATER, CARDIFF

Principal:
J. N. Rose, R.D., M.I.N., Master Mariner

PRE-SEA TRAINING

This Residential College provides a one-year's course of pre-sea training for young men of 16–18 years who wish to become Merchant Navy Officers. Special attention is given to the Cadets' character training, the development of reliability, resourcefulness, trustworthiness and initiative, to the development of the art of leadership and power of command, and to the fostering of a pride in the Merchant Navy as a whole and to their work and standing in particular.

The College has a 43-ton Auxiliary Sailing Vessel used for practical training at sea in the Bristol Channel. Remission of nine months' sea service will be allowed to successful cadets.

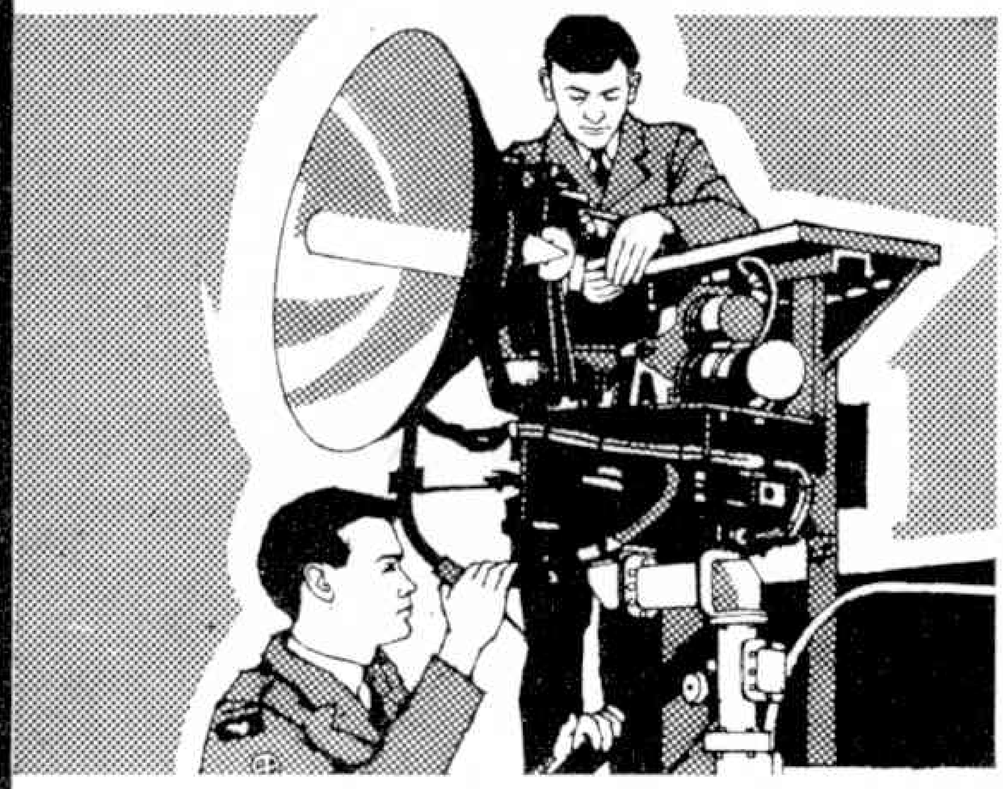
Fees for residence and tuition £135. Local Education Authorities should be consulted regarding financial assistance.

Prospectus and further information may be obtained from the Principal.

Robert E. Presswood,
Director of Education.

City Hall, Cardiff.

From 15, you can learn a good trade in today's R.A.F.



APPRENTICES

You must be 15-17 and be able to pass the entrance exam. (G.C.E. in specified subjects exempts you from this exam.) Your trade training is very thorough and, when you finish your training, you will be a fully qualified tradesman. Most apprentices qualify as Junior Technicians and, at 17½, can earn about £9 a week, all found. The prospects of promotion are good—you can earn £1,000 a year before you are 30.

BOY ENTRANTS

You must be 15½-16½ (15-17 in exceptional cases) and have a good trade aptitude. Your training lasts 18 months and includes general education as well as the theory and practice of your chosen trade. After qualifying you will be doing a man's job at a man's pay—and be earning, at 17½, £7.7.0. a week, all found.

If you are under 15, this is the time to find out what future the R.A.F. offers you. If you're over 17½, you can still learn a trade with the R.A.F. by joining as an aircraftman.

Write before August 31 to:

R.A.F Careers Information Centre (QP776),
Victory House, Kingsway, London W.C.2.



You will be sent free booklets giving full details, and the excellent pay rates, of the many exciting trades in today's R.A.F.

NAME .....

ADDRESS .....

..... DATE OF BIRTH .....

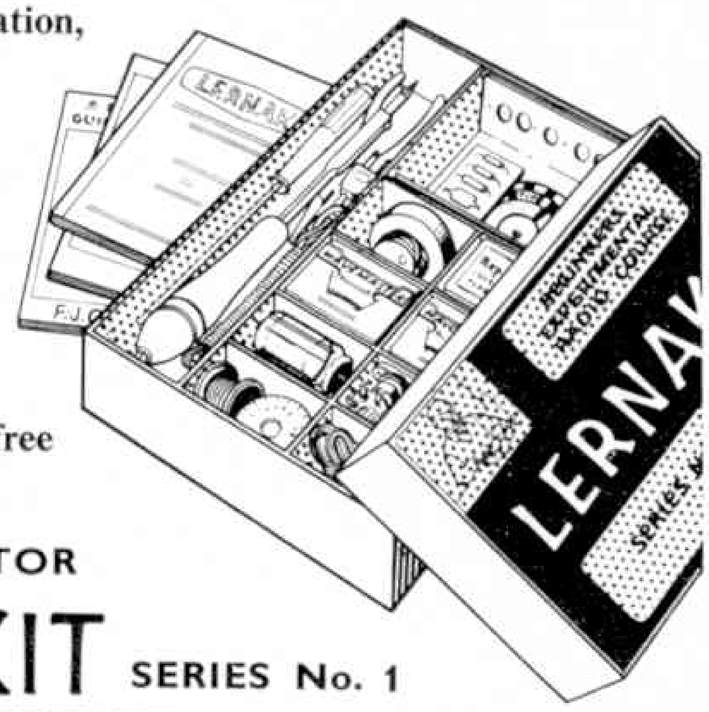
THE FUTURE IS WITH THE R.A.F.

LEARN-AS-YOU-MAKE-IT

NEW

BEGINNER'S EXPERIMENTAL RADIO COURSE

Radiostructor Organisation, the famous Electronic Training Institution, now offers a new very simple hobby kit course designed for the real Beginner. It is a fully self-contained course in which a simple radio receiver is built—send today for the exciting free Broadsheet.



RADIOSTRUCTOR

LERNAKIT SERIES No. 1

Please send me, without obligation, free exciting Broadsheet.



Name .....

Address .....

.....

To: BLOCK CAPITALS PLEASE

RADIOSTRUCTOR (Dept. L2), READING, BERKS.

READERS' SALES AND WANTS

Private advertisements (i.e. not trade) are charged 2d. per word, minimum 2/–. Cash with order. Readers' advertisements are published as soon as possible; inclusion in the first issue after receiving them cannot be guaranteed.

Advertisements of goods recently and currently manufactured by Meccano Ltd. are not accepted.

SALES

"M.M.s" January 1949 to December 1960. "Model Railway News", January 1959 to December 1960. Perfect condition. Offers—Hannah, 33 Aberlady Road, Haddington, East Lothian.

100 pre-war, post-war, Dinky Toys and Supertoys. S.A.E. for list.—Kitchen, 68 Harland Road, Southbourne, Bournemouth.

"M.M.s" 1945–54. Good condition, 15/–.—D. Palmer, 84 Glynde Way, Thorpe Bay, Essex.

Tri-ang Rolling Stock (British and Transcontinental) also Series 3 Track and Accessories, excellent condition £4 (with Engines £5). Apply—Daft, 47 Lulworth Road, Hallgreen, Birmingham 28.

"M.M.s" 1957–1960, 7/– any twelve.—Brooks, 53 Booth Lane North, Moulton, Northampton.

"M.M.s" 1945–48 inclusive, bound volumes, perfect. Offers to—Seaton, 122 Pierrefondes Avenue, Farnborough, Hants.

1947, 1948, 1949, 1950 Bound Volumes "M.M." Offers to—W. A. Hinchcliffe, 44 Greenhead Road, Huddersfield.

Pre 1939 Dinky Ships, Aircraft. S.A.E. for list.—J. W. Walker, 2 Penyghent View, Settle, Yorkshire.

Hand-made Pelham Puppet. (Hansel) 35/– new. Perfect condition, used once. What offers? Apply—D. Pelham, 39 Christchurch Avenue, London N.12.

Meccano Parts Nos. 167 and 169. "M.M.s" 1947–58. All in good condition and complete. Any offers? Tri-ang P5 Controller 30/–. Tri-ang No. 1 Power Unit 25/–.—Norris, 1 Burton Road, London S.W.9.

WANTS

Obsolete Dinky Toys, Buses, Cars, Vans, Lorries, etc., especially Guy Weetabix. Price and condition—J. Packer, 121 The Greenway, Uxbridge, Middlesex.

Hornby Gauge 0 Metropolitan Electric Locomotives in good condition. Mechanism unimportant.—Crosbie, Tremaynes, Windmill Lane, Wheatley, Oxford.

Pre-war and early post war Dinky Toys, high prices paid, any condition.—M. May, 6 College Road, Newport, Isle of Wight.

I will buy any Stamp Collections, Oddments, Duplicates, not common.—G. Baker, 6 St. Judes Road, Plymouth.

Tri-ang TT x T60 Electric Motor. Working condition, state price. Details—D. Smith, School House, Berkhamstead, Herts.

Obsolete Dinky Toys Military Vehicles in good condition, especially Medium Tank. All letters answered.—Yates, 44 Baskerville, Malmesbury, Wilts.

Russian Coins, state price, postage or Coins returned.—Cockerill, 61 Sellwood Road, Abingdon, Berks.

Pre-war Hornby "Book of Trains", state year—price.—Rougeau, 45 Main Street, Bridgeboro, N.J., U.S.A.

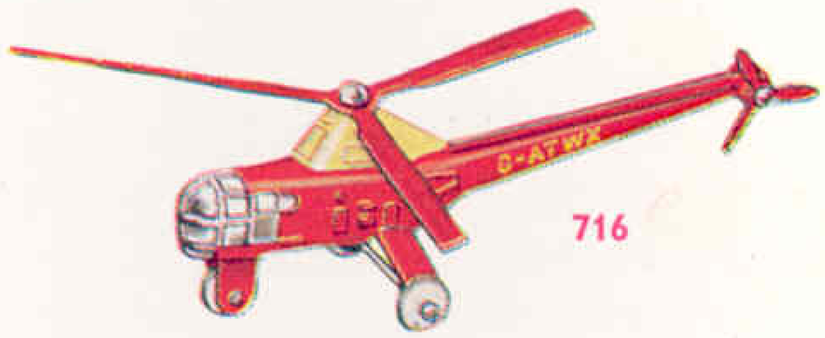
Stage your own air display



737



708



716



735



715



733

There's an excellent variety of aircraft in the Dinky Toys range, with which you can organise air displays of your own. A selection of models is illustrated here.

	U.K Price
708 Vickers Viscount 800 Airliner B.E.A. Span $5\frac{7}{8}$ in. . .	5/–
715 Bristol 173 Helicopter. Length overall 5 in. . .	3/–
716 Westland-Sikorsky Helicopter. Length overall $3\frac{1}{2}$ in.	2/9
*732 Meteor Twin Jet Fighter. Wing Span $2\frac{5}{8}$ in. . .	1/–
733 Shooting Star Jet Fighter. Wing Span $2\frac{3}{8}$ in. . .	1/3
*734 Supermarine Swift Fighter. Wing Span 2 in. . .	1/9
735 Gloster Javelin Delta Wing Fighter. Span $3\frac{1}{4}$ in. . .	2/6
*736 Hawker Hunter Fighter. Wing Span $2\frac{1}{8}$ in. . .	1/9
737 P.1B Lightning Fighter. Wing Span $2\frac{3}{16}$ in. . .	2/3
*738 DH.110 Sea Vixen. Wing Span $3\frac{3}{16}$ in.	3/–

** not illustrated*

DINKY TOYS

MADE BY MECCANO LTD., LIVERPOOL

NEW SHAPE ON THE TURNPIKE



Dinky Toys No. 449
Chevrolet "El Camino"
Pick-up Truck

Length $4\frac{3}{8}$ in. U.K. Price **5**/–

Two international winners join Dinky Toys this month: the Chevrolet "El Camino" Pick-up Truck with lots of room for goods and the fast Opel Kapitan. Both have the favourite Dinky Toys features: "finger-tip" steering, 4-wheel suspension, windows, seats and steering-wheel.

NEW SPEED ON THE AUTOBAHN



Dinky Toys No. 177 Opel Kapitan
Length $3\frac{15}{16}$ in. U.K. Price **4/6**

DINKY TOYS

TRADE MARK REGISTERED

MADE BY MECCANO LIMITED

Published by MECCANO LTD., Binns Road, Liverpool 13, England.

Printed by John Waddington Ltd., Leeds & London.